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THE OFFICIAL GUIDE FOR

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**NMAT**

by **GMAC™**

**REVIEW 2017**

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Free Online  
OG Practice  
Exam from  
GMAC®

- ▶ From the makers of the GMAT® and the NMAT by GMAC™ exams
- ▶ 2 full-length past NMAT by GMAC™ exam papers
- ▶ 480 questions from past NMAT™ exams, with answer explanations
- ▶ 550 practice questions with answer explanations including 240 NEW questions

[nmat.org.in](http://nmat.org.in)

# THE OFFICIAL GUIDE FOR **NMAT by GMAC™** REVIEW 2017

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## HOW TO NMAT

to take the NMAT  
and achieve your  
best score

the NMAT  
is a test of  
reasoning and  
problem-solving  
skills

Concepts  
are tested in  
the NMAT  
and are  
essential for  
success

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Dear Future NMAT by GMAC™ Test Taker and Business Leader,

Preparing for the NMAT by GMAC™ exam is an important step in your graduate management education journey. This book, *The Official Guide for NMAT by GMAC™ Review 2017*, is designed to help you study and achieve your personal best.

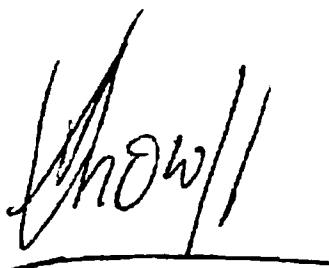
We are proud to have assumed ownership and management of the NMAT by GMAC™ exam in March 2015 and to be the first and only test publisher to bring its own original—and official—test prep material to the Indian marketplace.

As the organization known for its administration of the GMAT® exam, our mission is to connect the talent and aspirations of students globally with the opportunities provided through business and management education, and our official prep materials are designed to help you make that connection.

Our over 60 years of research and experience shows that proper preparation and using the right materials are essential to achieving a competitive score on any high-stakes exam.

By using this Official Guide to prepare for the NMAT by GMAC™ exam, you're taking a very important step toward gaining admission to a high quality business or management school or program of your choice.

I applaud your commitment to studying for the NMAT by GMAC™ exam and wish you the best success throughout your education and career.

A handwritten signature in black ink, appearing to read 'Sangeet Chowfla', with a horizontal line underneath.

**Sangeet Chowfla**

President and CEO

Graduate Management Admission Council®

Owners of the GMAT® and the NMAT by GMAC™ Exams

# HOW TO USE THE OFFICIAL GUIDE FOR NMAT BY GMAC™ REVIEW 2013

The Official Guide for NMAT by GMAC™ Review 2013 has been designed with the following features:

Understand the NMAT by GMAC™ Exam Format

Understand the NMAT by GMAC™ Exam Format

Understand the NMAT by GMAC™ Exam Format

Understand the NMAT by GMAC™ Exam Format

## 1.0 What is the NMAT by GMAC™ Exam?

## **HOW TO USE THE OFFICIAL GUIDE FOR NMAT BY GMAC™ REVIEW 2017**

The Official Guide for NMAT by GMAC™ Review 2017 has been designed with the following focus to help you study and achieve your personal best in the NMAT by GMAC™ exam:

### **Understand the NMAT by GMAC™ Exam Format**

Chapter 1 provides you in-depth information on the NMAT by GMAC™ exam format and structure, scoring pattern, and other key details.

### **Learn the Key Concepts**

The book takes a structured approach to acing the NMAT by GMAC™ exam by first introducing you to the key theoretical concepts tested in each of the three sections—Language Skills, Quantitative Skills and Logical Reasoning.

Therefore, Chapters 2, 4 and 6 are designed to provide you in-depth understanding of the key concepts and strategies for acing each section of the exam.

### **Apply the Key Concepts**

As the next step, the book provides a practice chapter after each of the three theory-based chapters. This helps you immediately test your learning for maximum knowledge retention.

Hence, Chapters 3, 5 and 7 are designed to provide you extensive practice with the help of more than 790 questions in total, including real NMAT questions and 240 new practice questions.

### **Experience Full-Length Past NMAT by GMAC™ Exams**

Chapter 8 of the book provides you two full-length past NMAT by GMAC™ Exam Papers (including 120 never-before-seen past NMAT questions)—with answers and detailed explanations—to mirror the actual exam experience.

### **Get Additional Practice through Exclusive Online OG Practice Exam from GMAC®**

As a bonus feature, the purchase of NMAT by GMAC™ Official Guide provides you free access to online OG Practice Exam from GMAC®.

4. **No negative marking:** Sometimes you're just not sure of the right answer on the test and are running out of time. Well, you can make an informed guess instead of skipping a question without the fear of a penalty for a wrong answer. The system of no negative marking is in line with global practices.
5. **Does not require any computer typing skills:** The NMAT by GMAC™ user interface is designed to minimise reliance on computer skills. You do not need to have prior computer experience to use CBT. No typing skills are needed. You will use the computer mouse to highlight and confirm the selected response as each question appears on the screen. At the beginning of the test, you will receive a brief introductory tutorial that will instruct you on how to use the computer to answer questions and review responses.

### Designed for your convenience

We know that you are busy and the task of registering for the test, taking the test and applying to school can be time consuming and stressful. So we've made it more convenient for you:

1. **Choose a date, time and location of your convenience:** A long testing window allows you to choose a convenient test date. The 75-day test window opens in the first week of October and extends through the third week of December.
2. **Self-schedule:** You can choose your test appointment date, time and location in real-time, based on the availability of seats at each test centre.
3. **Register from your mobile:** This feature allows you to register anytime and anywhere.
4. **Choose from multiple locations:** You can choose from any of the 32 conveniently located testing centres to take the exam.
5. **Send scores to up to 5 programmes for free:** You can choose to select the list of programmes you want to send your scores to before or after taking the exam. Up to 5 programmes are included in your registration fee. However, you will be able to send your scores to more than 5 programmes before or after you register for an additional fee.
6. **Apply to business schools after reviewing results:** You can view your results and then decide to apply to a business school or retake the test depending on your comfort with the results you've obtained.

## 1.0 What is the NMAT by GMAC™ Exam?

The NMAT by GMAC™ exam opens doors to the leading management programmes in India. Brought to you by the Graduate Management Admission Council (GMAC), the organisation that owns the GMAT® exam, the NMAT by GMAC™ enables schools to recruit top talent with the comfort that the test measures the skills needed to succeed in their programmes.

Since becoming a computer-based test (CBT) in 2009, the NMAT by GMAC™ has been at the forefront of measurement within high stakes testing. The NMAT by GMAC™ exam is used for securing admissions to some of the leading graduate business programmes in India.

In 2017, the NMAT by GMAC™ exam will build on these strengths by enhancing access to the exam. Schools will have access to one of the more diverse test taking populations in India with some of the highest proportions of women and non-engineers taking the exam. Prior to taking their exam, test takers will be able to access practice material to enhance their preparations.

## 1.1 Why take the NMAT by GMAC™ Exam?

The NMAT by GMAC™ exam has been, and will continue to be, a symbol of quality—enabling test takers to access graduate management education and a career of choice, while providing schools with access to top talent.

### Accepted as an admissions criterion by the leading management institutions in India

Today the NMAT by GMAC™ is accepted by 16 leading institutions and this list is growing. Pursuing a management degree at one of these universities makes the pursuit of your dreams that much easier.

For more information, please refer to the NMAT by GMAC™ Accepting Schools section or visit [www.nmat.org.in](http://www.nmat.org.in).

### Measures the skills needed to succeed in business school

When entering business school, you want to know that you have what it takes to succeed and graduate with flying colours. Having been selected using an assessment that measures the skills needed to succeed in business school gives you the confidence that you can handle the curriculum and have a fulfilling b-school experience.

### Designed to give you the confidence to perform to the best of your ability

When appearing for any test, nerves are always a contributing factor in how well you perform on the day of the test. The NMAT by GMAC™ exam was designed to allay those nerves. Here are some ways that drive that confidence:

1. **Taking the test multiple times:** You can take the NMAT by GMAC™ three times in a given admissions cycle. This gives you the confidence that you have more than a single opportunity to perform to your very best.
2. **Choosing the section order:** The NMAT by GMAC™ allows you to choose the order in which you respond to each of the sections on the test. This allows you to play to your strengths.
3. **Revisiting your answers:** You can review your answers at the end of each section so you always have the opportunity to revise your original response if you're not sure.

## 1.2 NMAT by GMAC™ Exam Format

## 1.2 NMAT by GMAC® Exam Format

The NMAT by GMAC® exam is computer-delivered and gives each candidate a random mix of questions. The number of questions in each section and the time limit for each section of the exam is based on all considerations of test construction, conditions, and the unique needs of when and where the test is administered. Candidates should be aware of selecting the right sequence of the test sections.

## 1.3 NMAT by GMAC® Exam Structure and Features

The NMAT by GMAC® exam format is divided into three sections: **Verbal Reasoning**, **Quantitative Reasoning**, and **Logical Reasoning**.

Each candidate will receive an exam with 120 minutes to complete the test.

Section	Questions	Time
Verbal Reasoning	40 questions	40 minutes
Quantitative Reasoning	40 questions	40 minutes
Logical Reasoning	40 questions	40 minutes

Each section is a random mix of questions.

Candidates have the ability to select the order of the sections.

The structure of the NMAT by GMAC® exam is designed to be flexible. Candidates can take the exam in any order and at any time. The exam is delivered in a random mix of questions and the order of each section will be different for each candidate. The exam is delivered before the candidate has completed the exam. The exam is delivered in a random mix of questions and the order of each section will be different for each candidate.

## 1.4 Review Exam

## 1.5 NMAT by GMAC® Exam Format

The NMAT by GMAC® exam is a computer-delivered exam.

The exam is divided into three sections: **Verbal Reasoning**, **Quantitative Reasoning**, and **Logical Reasoning**.

The exam is delivered in a random mix of questions and the order of each section will be different for each candidate. The exam is delivered before the candidate has completed the exam. The exam is delivered in a random mix of questions and the order of each section will be different for each candidate.



## 1.5 NMAT by GMAC™ Scores

The NMAT by GMAC™ exam scales scores by section and test total scaled score will be announced within 4-5 weeks after the candidate has tested. The percentile scores will be calculated after all candidates have taken their exam(s) and announced in January of every year on the NMAT by GMAC™ website at [www.nmat.org.in](http://www.nmat.org.in).

### What is included in your score report?

Your scores will include a scaled score for each section, a total score as well as a percentile ranking. The following table lists the range of scores possible on the different sections of the NMAT by GMAC™ exam.

Section	Score Range
Quantitative Skills	0-144
Language Skills	0-96
Logical Reasoning Skills	0-120
Total	0-360

When your scores are first published, the percentile ranking associated with your scores will represent historical percentiles from the previous year's results. These will serve as a guide to you as well as the schools that receive your scores about how you've performed relative to your peers. The final percentile rankings for this year will be calculated after all the candidates have taken their exam(s) and announced in January of every year on the NMAT by GMAC™ website at [www.nmat.org.in](http://www.nmat.org.in).

### Scaled scores and percentile scores

**Scaled scores**—All of the test forms are equated to account for any differences in overall difficulty and the raw test scores are placed on a common scale. This process ensures that scores are comparable across test forms such that the scores are not impacted by different candidates getting different test forms.

**Percentile scores**—The percentile rank or score shows how a candidate performed compared to all other candidates who took the exam (e.g. all candidates who took the NMAT by GMAC™ exam in 2016). For example, if a candidate is said to be at the 75th percentile, the candidate scored better than 75 percent of the candidates who took the NMAT by GMAC™ in the year 2016.

Candidates will not be sent any results directly. GMAC will publish scaled scores every 4-5 weeks and the final percentile results will be posted on the NMAT by GMAC™ website. Once the scores have been published, you will receive an email indicating that your scores are available. You will be able to access by logging into the website [www.nmat.org.in](http://www.nmat.org.in). At the same time, your scores will be sent to the schools that you selected to share your scores.

## 1.2 NMAT by GMAC™ Exam Format

The NMAT by GMAC™ exam is computer-delivered and gives each candidate a randomly generated test. The number of questions, difficulty levels, and the time limit for each of the sections is predetermined and, under normal administration conditions, are the same regardless of when and where the test is administered. Candidates have a choice of selecting the order/sequence of the test sections.

## 1.3 NMAT by GMAC™ Exam Structure and Features

The NMAT by GMAC™ exam has three sections targeted at measuring different skills—Language Skills, Quantitative Skills, and Logical Reasoning.

Each candidate will receive an exam with 120 items divided into the following sections:

Language Skills	32 questions	22 minutes
Quantitative Skills	48 questions	60 minutes
Logical Reasoning	40 questions	38 minutes
Total	120 questions	120 minutes

Each section is further divided into subsections.

Candidates have a choice of selecting the order/sequence of the test sections.

The three sections of the NMAT by GMAC™ are individually timed. Test takers must answer questions and review answers of each section within the allotted time. Test takers must review their answers before moving to another section of the exam, as once the candidate closes out of a section, all answers are final.

## 1.4 Review Exam

At the end of each section, candidates will be presented with a Review screen to identify the questions that they have left incomplete or flagged for review while attempting the test. Candidates can go directly to specific questions by clicking on the question number on the Review screen.

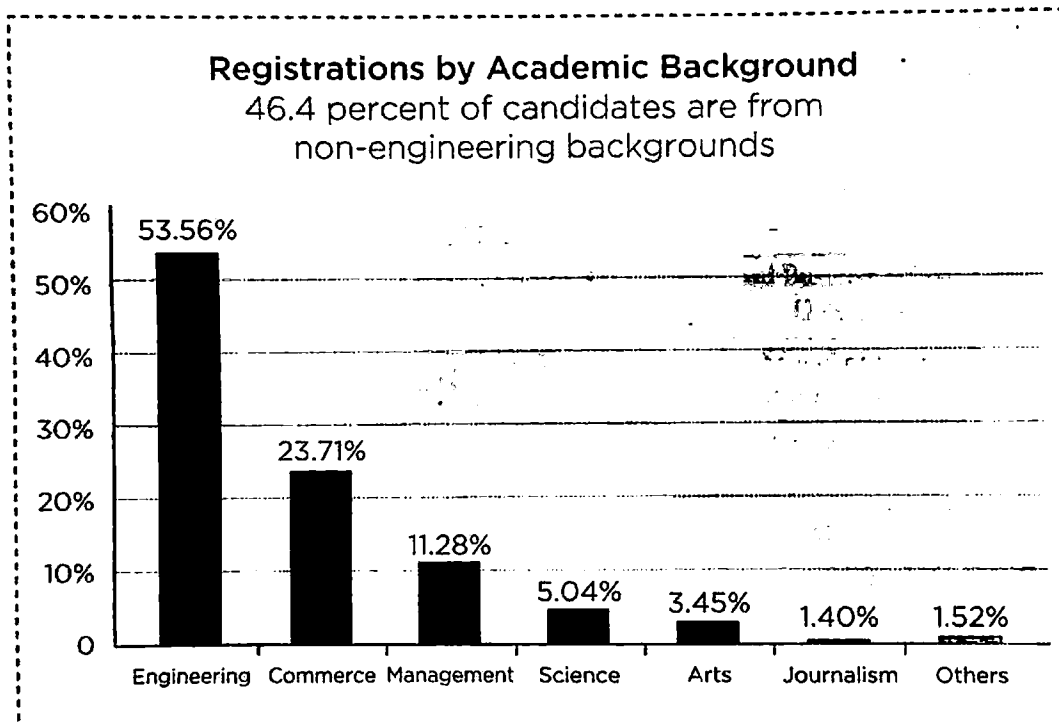
Each of the three sections has individual section timings and candidates have to answer and review the questions of the particular section within the allotted time.

In case a candidate completes the section (answering and reviewing) before the section time expires, any balance of time will not be added to the next section(s). The next section has its own time allocation and candidates must complete the section within the allotted time.



# 1.6 NMAT by GMAC™ Accepting Schools

## NMAT by GMAC™ Test Taker Data (2016)



**NMAT by GMAC™ 2016 yet again disproved a B-school stereotype by recording 46.4% registrations from candidates with non-engineering backgrounds**

## 1.8 NMAT by GMAC™ Test Centres

The NMAT by GMAC™ exam will be administered at 44 locations within India. The following are the current test taking locations:

Cities*	Region
Agra, Chandigarh, Dehradun, Delhi, Faridabad, Gurugram, Noida, Jammu, Kanpur, Lucknow, Patiala, Varanasi	North
Ahmedabad, Jaipur, Jodhpur, Kota, Mumbai, Nagpur, Nasik, Pune, Pilani, Surat, Vadodara	West
Bengaluru, Chennai, Kochi, Hyderabad, Manipal, Mysore, Tiruchirapalli, Vellore, Vizag, Vijaywada	South
Bhopal, Indore, Jabalpur, Raipur	Central
Bhubaneswar, Guwahati, Jamshedpur, Kolkata, Patna, Ranchi, Shillong	East

Some cities will have multiple test centres to choose from.

\*GMAC® reserves the right to change the locations at any given point of time without any notice. For the latest information on test centres, please visit [www.nmat.org.in](http://www.nmat.org.in)

In 2018, NMAT by GMAC™ will be offered at the following international locations:

- Kathmandu
- Thimphu
- Dhaka
- Colombo

## 1.9 About GMAC

The Graduate Management Admission Council (GMAC) is a global non-profit organisation comprised of leading graduate business schools around the world. GMAC is the owner and administrator of the GMAT® and NMAT by GMAC™ exams.

GMAC believes that business and management are critical to the economic and social well-being of people worldwide. We advocate for graduate management education and its value to individuals and society.

GMAC strives to increase access in order to grow and diversify the candidate pool; develop assessments to meet global management education needs; and extend the value to schools with our products, services, and industry knowledge.


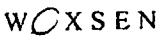


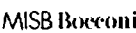






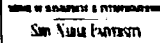




GMAC meets the needs of management schools, and current and prospective students, through a wide array of products, services, and programmes designed to open doors for students, professionals, and information about quality graduate management education. GMAC® also serves as the leading source of research and

## 1.6 NMAT by GMAC™ Accepting Schools

The NMAT by GMAC™ exam is an MBA entrance exam for admissions to the following universities in India. For the most up-to-date list, please visit the website of the university/institution.

It is the responsibility of the candidate to understand the eligibility requirements of the management programme to which they are applying before deciding to register for the NMAT by GMAC™ exam. If a candidate registers for the test and then determines that he/she is not eligible for admission to the intended programme, no refunds will be offered.

All candidates are required to appear for the NMAT by GMAC™ exam to be conducted across the country. For more information on the NMAT by GMAC™, please visit [www.nmat.org.in](http://www.nmat.org.in).

1.	NMIMS University, Mumbai, Bangalore, Hyderabad		9.	Woxsen School of Business, Hyderabad	
2.	Xavier University, Bhubaneswar		10.	SRM University, Chennai	
3.	MISB Bocconi, Mumbai		11.	Hyderabad Business School, Gitam University	
4.	University of Petroleum & Energy Studies (UPES), Dehradun		12.	Gitam School of International Business, Vizag	
5.	VIT University, Vellore		13.	Mody University, Rajasthan	
6.	LM Thapar Institute of Management, Chandigarh		14.	School of Management and Entrepreneurship, Shiv Nadar University	
7.	Amity University, Delhi NCR		15.	Alliance University, Bangalore	
8.	BML Munjal University, Delhi		16.	ICFAI University, Hyderabad and other locations	

## 1.7 Important Dates

Event	Start	End
Registration	Tuesday, July 04, 2017	Tuesday, October 03, 2017
Scheduling	Tuesday, July 04, 2017	Monday, October 16, 2017
Late Registration	Wednesday, October 04, 2017	Saturday, October 14, 2017
Rescheduling	Tuesday, July 04, 2017	Friday, December 15, 2017
Exam Delivery	Thursday, October 05, 2017	Monday, December 18, 2017
Retake Registration	Friday, October 06, 2017	Thursday, December 14, 2017
Retake Scheduling	Friday, October 06, 2017	Friday, December 15, 2017
Final Announcement of Results		3rd week of January, 2018

## 2.0 Quantitative Skills Review

## 2.0 Quantitative Skills Review

Use this section to review the quantitative skills you will need for the NMAT. The section includes a list of topics to review and a list of practice questions.

Review the following topics:

1. Number Lines
2. Fractions
3. Percentages
4. Ratios and Proportions
5. Algebra
6. Geometry
7. Algebra and Math
8. Time Spots
9. Time and Work
10. ...

In various Practice Sections of this book, several questions are marked as *Real NMAT Question*. *Real NMAT Question* denotes that this question has appeared in an NMAT™ (now NMAT by GMAC™) exam in the past.

## Quantitative Skills Review

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## 2.1 Top Tips to Prepare for Quantitative Skills

1. You will get 48 questions in the Quantitative Skills section on the NMAT by GMAC™ exam that you will have to attempt in 60 minutes. This means you have roughly 1.25 minutes per question.
2. This section will test you on the four important areas of Math—Arithmetic, Algebra, Geometry and Modern Math.
3. Make sure you have looked at all of the questions before the time allotted for the section runs out. Evaluate each question on the basis of the time you think it would take you to solve it and its difficulty level and attempt the easier ones first since the marks are the same for each question.
4. Time is the most important resource on the NMAT by GMAC™ exam. If you feel you can answer a question correctly but it will take you 2 minutes or more to do so, flag and skip the question, and come back to it at the end if you have time left.
5. Do not assume that questions should always be answered using the long methods you learnt in school. Most of the NMAT by GMAC™ quant questions can be solved faster using short cuts and tricks, some of which you will learn in this book.
6. Start with the basics. Make sure you are clear on fundamental number properties, formulae and number operations concepts such as odds and evens, prime numbers, LCM and HCF, etc., before moving on to the more advanced concepts.
7. Given the time constraints, your mental math will have to be quite good to arrive at the answer quickly. So, make sure you remember multiplication tables and square of numbers up to 20. It also helps to know some common fractions and their percentage equivalents such as  $12.5\% = \frac{1}{8}$ , etc.
8. For Data Sufficiency questions, focus on the *sufficiency* aspect and not on the actual answer.
9. Read the question carefully so that you understand it properly before answering. Do not assume anything. A slight misinterpretation of the question can take you to an incorrect answer.
10. Take a quick look at the options before you attempt to solve a question. In some questions, it may be faster and easier to simply back-solve from the answer choices.

## 2.0 Quantitative Skills Review

Although this chapter provides a review of some of the mathematical concepts of arithmetic, algebra and geometry, it is not intended to be a textbook. You should use this chapter to familiarise yourself with the kinds of topics that may be tested in the NMAT by GMAC™ exam. You may wish to consult an arithmetic, algebra or geometry book for a more detailed discussion of some of these topics.

The first section, 'Arithmetic', includes the following topics:

1. Number System
2. Averages
3. Percentages
4. Ratio and Proportion
5. Exponents
6. Profit, Loss and Interest
7. Alligations and Mixtures
8. Time, Speed and Distance
9. Time and Work
10. Clocks
11. Calendars

The second section, 'Algebra', includes the following topics:

1. Linear Equations
2. Simultaneous Equations
3. Quadratic Equations
4. Inequalities

The third section, 'Geometry and Mensuration', includes the following topics:

1. Lines and Angles
2. Triangles
3. Quadrilaterals
4. Circles
5. Three-Dimensional Figures

The fourth section, 'Modern Math', includes the following topics:

1. Permutation and Combination
2. Probability
3. Progression
4. Set Theory
5. Coordinate Geometry

The fifth section includes 'Data Interpretation'

The sixth section includes 'Data Sufficiency'

## 2.2 Arithmetic



# 1 Number System

## Introduction

In order to understand quantitative skills, it is important to understand numbers as they are the basic building blocks of entire mathematics. This unit is about understanding numbers and their basic properties.

## Understanding numbers

While numbers can be divided into various types, for the NMAT by GMAC™, you need to be conversant with the following types of numbers.

### Natural and whole numbers

Numbers from 0, 1, 2, 3, so on are known as whole numbers. Natural numbers do not include 0.

### Integers and fractions

Numbers  $-1, 0, 1, 2$ , etc., which have no fractional part, are called integers. Integers include the counting numbers  $(1, 2, 3, \dots)$ , their negative counterparts  $(-1, -2, -3, \dots)$  and 0.



**Important Learning:** 0 as a number is neither a negative integer nor a positive integer. Also, 0 and all positive integers are called non-negative integers.

A fraction is a quantity that represents a part of a whole. It has two parts—a numerator and a denominator. There are two types of fractions:

1. **Proper fractions:** Fractions of the form  $\frac{A}{B}$ , where A and B are integers and A is less than B, are called proper fractions. For example,  $\frac{2}{3}$ ,  $\frac{4}{7}$ ,  $\frac{7}{11}$  and so on.
2. **Improper fractions:** Fractions of the form  $\frac{A}{B}$ , where A and B are integers and A is greater than B, are called improper fractions. For example,  $\frac{5}{3}$ ,  $\frac{8}{7}$ ,  $\frac{11}{9}$  and so on.

### Important concepts about fractions

1. If the numerator is increased while keeping the denominator constant, the fraction increases in value and vice versa.
2. If the denominator is increased while keeping the numerator constant, the fraction decreases in value and vice versa.
3. A quick method of comparing two positive fractions is to multiply the numerator of the first fraction with the denominator of the second and vice versa. If the product on the left side is larger, then the left fraction is greater and if the product on the right side is larger, then the right fraction is greater. For example, compare  $\frac{3}{7}$  and  $\frac{5}{11}$ . On cross-multiplying, we get  $3 \times 11 = 33$  and  $5 \times 7 = 35$ . Since  $35 > 33$ , the fraction that corresponds to 35, that is  $\frac{5}{11}$ , is greater.

### Prime and composite numbers

A number which has exactly two different factors, that is, 1 and the number itself is a prime number (3, 11, 19, etc.) and a number having more than two different factors is a composite number (4, 12, 20, etc.).

## 2.3 What is Measured?

The arithmetic section comprises topics such as averages, profit and loss, ratio and proportion, percentages, time, speed and distance, number systems, simple and compound interest, mixtures, calendars, etc.

Basic arithmetic questions test your ability to interpret and solve problems of a mathematical nature, using such operations as addition, subtraction, division and multiplication, and in a variety of problem formats and situations.

While most of the concepts in arithmetic are quite simple, the NMAT by GMAC™ will not always test you on straightforward concepts; rather, it will mix up two or more topics, so you may see a question that combines percentages and ratio and proportion.

The arithmetic section will also test your mental math skills as you will be required to make quick calculations in your head.

## 2.4 Overall Test Taking Strategies

- Read the question carefully.
- Look at the options once before you start solving the question.
- Be aware of the common mathematical operations between odd and even numbers.
- Remember the divisibility rules for common numbers, frequently tested squares and cubes and multiplication tables up to 20.
- Be clear about the equivalent of common fractions as percentage and also about decimal terms.
- Try to pick numbers and back-solve from the answer choices.

The next few sections will provide you with in-depth strategies for approaching each topic.

**Decimals**

Decimals are numbers that fall in between integers. They express a part-to-whole relationship in terms of place value. For example, 1.2 is a decimal. The integers 1 and 2 are not decimals. An integer written as 1.0, however, is considered a decimal.

**Digits and place value**

There are 10 digits that make up all numbers: 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. For example, the three-digit number 412 consists of the digits 4, 1 and 2.

Every digit in a given number has a particular place value. The place value depends upon the digit's location relative to the decimal point.

Place value of digits in a number											
6	7	8	9	1	0	2	3	.	8	3	4
TEN MILLIONS	ONE MILLION	HUNDRED THOUSANDS	TEN THOUSANDS	THOUSANDS	HUNDREDS	TENS	ONES	DECIMAL	TENTHS	HUNDRETHS	THOUSANDTHS

**Divisibility rules for numbers**

Now, let us look at the divisibility rules for some important numbers that will help you make quick calculations.

- Divisibility rule for 2:** A number is divisible by 2 if its last digit is 0 or even, that is, 0, 2, 4, 6 or 8. All even numbers are divisible by 2.
- Divisibility rule for 3:** A number is divisible by 3 if the sum of all the digits of the number is divisible by 3. For example, let us take the number 4,689. Now, the sum of the digits will be  $4 + 6 + 8 + 9 = 27$ , and since 27 is divisible by 3, the number 4,689 is also divisible by 3.
- Divisibility rule for 4:** A number is divisible by 4 if the number formed by its last 2 digits is divisible by 4. Let us take the example of 4,689. The number formed by the last 2 digits is 89, and since 89 divided by 4 gives a remainder of 1 so 4,689 when divided by 4 will also give a remainder of 1.
- Divisibility rule for 5:** A number is divisible by 5 if its last digit is 0 or 5.
- Divisibility rule for 6:** A number is divisible by 6 if it is divisible by both 2 and 3.

Since the number 1 has only one factor that is 1 itself, it is neither a prime number nor a composite number.



**Important Learning:** 1 as a number is neither prime nor composite.

Some properties and observations on prime numbers are:

1. 2 is the smallest prime number.
2. 2 is the only even prime number; all other prime numbers are odd.
3. There are 25 prime numbers when counted from 1 to 100.
4. Every prime number, except 2 and 3, can be expressed as a multiple of 6 + 1 or 6 - 1 (that is,  $6N + 1$  or  $6N - 1$ ).

### Odd and even numbers

All the numbers which are completely divisible by 2 are called even numbers (e.g. 2, 4, 6, 8, 10) and numbers which are not divisible by 2 are called odd numbers (e.g. 1, 3, 5, 7, 9, 11).

0 as a number will be treated as neither even nor odd, until and unless specified otherwise. Therefore, we have

1. Five odd digits: 1, 3, 5, 7, 9
2. Four even digits: 2, 4, 6, 8
3. One digit which is neither even nor odd: 0

### Important operations with odd and even numbers

Function	Result
Even + Even	Even
Even + Odd	Odd
Odd + Odd	Even
Even - Even	Even
Even - Odd	Odd
Odd - Odd	Even
Even × Even	Even
Even × Odd	Even
Odd × Odd	Odd
Even ÷ Even	Anything (even, odd or not an integer)
Even ÷ Odd	Even or not an integer
Odd ÷ Even	Not an integer
Odd ÷ Odd	Odd or not an integer



## Alpha numerals

Alpha numerals form another popular category of problem in the number system. These problems are called alpha numerals because they combine the basic concepts of alphabets and numbers. There are a few things that need to be known before we look at various problems based on alpha numerals:

1. A two-digit number will always be written as  $10x + y$  and not as  $xy$ . Similarly, a three-digit number will be written as  $100x + 10y + z$ . But the digits of a two-digit number will be called  $x$  and  $y$ .
2. The sum of a two-digit number and the number obtained by interchanging the digits is always divisible by 11.

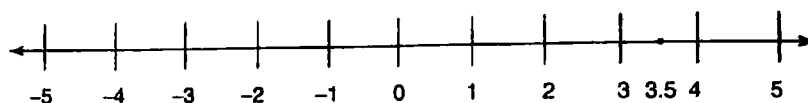
$$(10x + y) + (10y + x) = 11x + 11y = 11(x + y)$$

3. The difference of a two digit number and the number obtained by interchanging the digits is always divisible by 9.
4. Any two two-digit numbers can be added to make a maximum sum of 198.

## BODMAS

BODMAS stands for Brackets, Of, Division, Multiplication, Addition and Subtraction. This acronym helps us remember the sequence in which to carry out arithmetic operations.

## Number line and absolute value



Number line

A number line is a line on which all real numbers can be placed as per their value. Each point on the number line corresponds to a real number. For example, in the figure, above, the number 3.5 corresponds to a point on the number line which is halfway between 3 and 4.

The absolute value of a point is its distance from 0 on the number line. A positive number is already in the same form as that number's absolute value. For a negative number, remove the negative sign to get that number's absolute value. For example, the absolute value of  $-2$  is 2. The absolute value is denoted by two vertical parallel lines.



**Important Learning:** The absolute value of a number cannot be negative.

## 2 Averages

### Introduction

An average is typically the central value of a set of numbers. In this chapter, we will look at the three typical averages you will come across on the NMAT by GMAC™—mean, median and mode.

### Mean

The mean is the most common type of average that you will work with and is defined as the sum of all observations divided by the number of observations. Therefore,

$$\text{Mean} = \frac{S_n}{n}$$

6. **Divisibility rule for 8:** A number is divisible by 8 if the number formed by its last three digits is divisible by 8.
7. **Divisibility rule for 9:** A number is divisible by 9 if the sum of all its digits is divisible by 9.
8. **Divisibility rule for 10:** A number is divisible by 10 if its last digit is 0.
9. **Divisible by 12:** A number is divisible by 12 if it is divisible by both 3 and 4.

## Factors, multiples, least common multiple and highest common factor

### Factors and multiples

A factor is a number that is able to completely divide a number greater than or equal to it. For example, 2 is a factor of 4 and 3 is a factor of 15, but 2 is not a factor of 15.

On the other hand, a multiple is a number that may be divided by another number a certain number of times without leaving a remainder. So, 4 is a multiple of 2, 15 is a multiple of 3, but 15 is not a multiple of 2 since dividing 15 by 2 will leave a remainder of 1.

### Factor foundation rule

If  $a$  is a factor of  $b$  and  $b$  is a factor of  $c$ , then  $a$  is also a factor of  $c$ . For example, 3 is a factor of 9 and 9 is a factor of 81. Therefore, 3 is also a factor of 81.

### Prime factorisation

Prime factorisation is a way to express any number as a product of prime numbers. For example, the prime factorisation of 30 is  $2 \times 3 \times 5$ . Prime factorisation is useful in answering questions about divisibility.

### Highest common factor

We already have an understanding of what is a factor. The Highest Common Factor or HCF is the highest common factor among all the factors of a set of given numbers. It is also known as the Greatest Common Factor (GCF) or the Greatest Common Divisor (GCD). For example, the HCF of 24 and 40 will be 8, since 8 is the largest number that can evenly divide into both 24 and 40.

### Least common multiple

The Least Common Multiple or LCM is the least common multiple of any set of given numbers. LCM refers to the smallest multiple of two (or more) integers. Multiples will be equal to or larger than the starting integers. The LCM of 6 and 15 is 30, because 30 is the smallest number that both 6 and 15 go into.

### Properties of HCF and LCM

Following are properties of HCF and LCM:

1. For any set of given numbers, the LCM is always a multiple of the HCF.
2. For two given numbers, product of the numbers is equal to the product of their HCF and LCM. (This property will also hold true for 3 numbers, 4 numbers and so on, provided none of them have a common factor other than 1.)
3. For a set of given fractions

$$\text{LCM of fractions} = \frac{\text{LCM of the numerator}}{\text{HCF of the denominator}}$$

$$\text{HCF of fractions} = \frac{\text{HCF of the numerator}}{\text{LCM of the denominator}}$$

Before doing this, we need to bring the fractions to the smallest or lowest form.

Also, the understanding of percentages forms an important aspect of data interpretation (DI), in which questions require you to calculate percentage values, growth rates and other percentage changes.

So, what is a percentage? Any value expressed on a base of 100 or over a base of 100 is called percentage and is represented as % (cent represents the base 100).

A fraction is another way in which the value of a particular percentage can be represented. Therefore, one can say that percentages and fractions are equivalent and can be converted into one another as per the need.

For example, 25% is the same as  $\frac{1}{4}$ , 33.33% is the same as  $\frac{1}{3}$ , 50% is the same as  $\frac{1}{2}$  and so on.

1. To convert a percentage into a fraction, divide the percentage by 100. For example, 20% is same as

$$\frac{20}{100} = \frac{1}{5}$$

2. Similarly, to convert a fraction into a percentage, multiply the fraction by 100. For example,

$$\frac{2}{5} = \left(\frac{2}{5}\right) \times 100 = 40\%$$

### Percentage equivalent of fractions

We need to know the percentage equivalent of fractions in order to enhance our understanding of percentages as a concept and to help in quick calculations.

For example, the percentage equivalent of  $\frac{1}{2}$  will be  $\left(\frac{1}{2}\right) \times 100 = 50\%$ . Instead of saying  $\frac{1}{2}$  or half of value, we can also say that we are calculating 50% of the given value.

Students must know the percentage equivalent of fractions up to  $\frac{1}{20}$ .

Let us look at some of these values:

1.  $\frac{1}{2} = 50\%$
2.  $\frac{1}{3} = 33.33\%$
3.  $\frac{1}{4} = 25\%$
4.  $\frac{1}{5} = 20\%$
5.  $\frac{1}{6} = 16.66\%$
6.  $\frac{1}{8} = 12.5\%$
7.  $\frac{1}{9} = 11.11\%$
8.  $\frac{1}{10} = 10\%$
9.  $\frac{1}{15} = 6.66\%$
10.  $\frac{1}{20} = 5\%$

**Multiplication factor**

To find the value of  $R\%$  of a number, we multiply that number by  $\frac{R}{100}$ . If we want to find out 35% of a given number, we need to multiply the number by  $\frac{35}{100}$  or 0.35.

To increase a number by  $R\%$ , we multiply the number by  $\frac{(100 + R)}{100}$ , and to decrease a number by  $R\%$ , we multiply the number by  $\frac{(100 - R)}{100}$ .


We need to understand that finding out  $R\%$  of a number and increasing or decreasing a given number by  $R\%$  are different operations.

The factor with which we multiply a number in order to (a) find the value of certain percentage of a given number, (b) increase the value of a number by a particular percentage or (c) decrease the value of a number by a particular percentage is called the **multiplication factor**.

For example, if we have to increase 120 by 20%, we need to multiply 120 by  $\frac{(100 + 20)}{100}$  or  $\frac{120}{100}$  or 1.2. In this case, 1.2 is the multiplication factor. The result is  $120 \times 1.2 = 144$ . Therefore, if we increase 120 by 20%, the final result will be 144.

Let us look at the multiplication factor for some cases:

1. To increase a number by 17%, the multiplication factor will be  $\frac{(100 + 17)}{100} = 1.17$ .
2. To decrease a number by 11%, the multiplication factor will be  $\frac{(100 - 11)}{100} = 0.89$ .
3. To increase a number by 34%, the multiplication factor will be  $\frac{(100 + 34)}{100} = 1.34$ .
4. To decrease a number by 30%, the multiplication factor will be  $\frac{(100 - 30)}{100} = 0.7$ .
5. To find 40% of a number, the multiplication factor will be 0.4.

 **Important Learning:** If A is 20% more than B, then B will not be 20% less than A.

**Base and base change**

In percentages, it is very important to understand the base on which the change is happening. For example, let us take two numbers, say 40 and 50, and carry out the following operations:

1. Determine what percent of 40 is 50.

For this, we need to express 50 as a percentage of 40, that is,  $\left(\frac{50}{40}\right) \times 100 = 125\%$ . Therefore, 50 is 125% of the given value 40.

2. Express 40 as a percent of 50.

For this, we need to find out 40 as a percentage of the given base value, that is, 50. Therefore,

$$\left(\frac{40}{50}\right) \times 100 = 80\%$$



**Do not commit this common error:** There are two things that a student must appreciate. 50% is what percentage of 40% and 50% is how much more than 40% are two different problems. In the example, we are being asked about how much more is 50% than 40%. Many students make the mistake of saying that the required answer is 10%, which is the difference between the given values 50 and 40. The percentage affixed after the given values probably creates this confusion. What if the two values were 50 km/h and 40 km/h, that is, speed, or 50 kg and 40 kg, that is, weight?

## 4 Ratio and Proportion

### Introduction

Ratio is a comparison between two or more similar quantities having the same dimensions; therefore, ratio happens to be a dimensionless quantity.

For example, when we mention that the speed of two persons A and B is in the ratio 2:3, we do not ask whether the speed is in km/h or m/s, as the ratio is a simple comparison between two similar variables or values.

A ratio and fraction are synonymous yet different entities. When we say that  $a:b$  is 2:3, we are talking about the ratio. Ratios are used to make comparisons, but when we need to find the individual contributions or values, fractions are required for the same.

Therefore, if  $a:b$  is 4:3, we understand that for every value of 4 that  $a$  gets,  $b$  will get a value of 3, and so  $a$  gets a value of 4 for every 7 that they get together. This is known as a fraction.

Fraction of  $a$  is  $\frac{4}{(4+3)}$ , that is  $\frac{4}{7}$ , and fraction of  $b$  is  $\frac{3}{(3+4)}$ , that is  $\frac{3}{7}$ .

### Properties of ratios

Some of the basic properties of ratios are listed below:

1. For two ratios to be compared, they need to have something in common; otherwise, a comparison is not possible. For example, two ratios  $c:d$  and  $e:f$  cannot be compared unless we have some other relation between the ratios. If  $a:b$  is 2:3 and  $b:c$  is 4:5 and we need to compare  $a$  and  $c$ , we need to equate and make the common variable equal in both the ratios. (In this case, it is  $b$ .) In order to do this, we multiply the first ratio by 4 and the second by 3. So,  $a:b$  becomes 8:12, while  $b:c$  becomes 12:15. Now, both the ratios can be compared and  $a:b:c$  is 8:12:15.
2. Ratio is just a comparison and does not tell us anything about the actual values. If the weight of two things is in the ratio 5:6, their actual values are not known unless some other information is provided. For example, if the heights of  $c$  and  $d$  are in the ratio 6:7, we do not know or cannot say anything about their actual heights.
3. If  $\frac{a}{2} = \frac{b}{3} = \frac{c}{4}$ , then we can write

$$\frac{a}{2} = \frac{b}{3} = \frac{c}{4} = k$$

So,  $a = 2k$ ,  $b = 3k$  and  $c = 4k$

Therefore,  $a:b:c$  will be in the ratio 2:3:4.

4. If  $a:b:c$  is  $\frac{1}{2} = \frac{1}{3} = \frac{1}{4}$  and we need to bring them to a different form, we will multiply by the LCM of the denominators (that is, 2, 3 and 4), which happens to be 12.

So,  $a:b:c$  will become

$$\frac{12}{2} = \frac{12}{3} = \frac{12}{4}$$

that is, 6:4:3



**Important Learning:** Ratio between two quantities or variables is only a comparative measure. It does not tell you anything about the actual values. For calculating actual values, you need to use fractions.

### Proportion and variation

Proportion is directly connected to ratios. Basically, a proportion is a statement that tells us that two ratios are equal. It can be written in two ways:

1. Two equal fractions,  $\frac{a}{b} = \frac{c}{d}$  or
2. Using a colon,  $a:b = c:d$

When two ratios are equal, the cross-multiplication of the ratios is also equal. For example,

$$\frac{2}{9} = \frac{6}{27} \Rightarrow 2 \times 27 = 6 \times 9$$

#### Direct proportionality

$Y$  is said to be directly proportional to  $X$  if  $Y$  increases as  $X$  increases and  $Y$  decreases as  $X$  decreases. Here,  $Y$  is called the dependent variable, while  $X$  is called the independent variable.

We can write the relation in the form  $Y = KX$ , where  $K$  is called the constant of proportionality.

#### Applications of direct proportionality

1. Distance covered is directly proportional to speed if time of travel is constant.
2. Amount of work done is directly proportional to the number of people if the number of days is constant.

#### Inverse proportionality

$Y$  is said to be inversely proportional to  $X$  if  $Y$  decreases as  $X$  increases and  $Y$  increases as  $X$  decreases.

We can write the relation in the form  $Y = \frac{K}{X}$ , where  $K$  is called the constant of proportionality.

#### Applications of inverse proportionality

1. Time taken is inversely proportional to speed if distance is constant.
2. Number of days is inversely proportional to the number of people if the amount of work done is constant.

### Age-related problems

Problems based on ages are a simple application of the concept of ratios. In all problems of ages, we need to follow the instructions given in the problem keeping the time shift in consideration.

#### Important Points

1. We can take the unknown variable as the current age of the persons in the question or their age a few years earlier or a few years later. The answer will be the same, provided we keep the time shift in consideration.
2. The difference between the ages of two persons will always be the same whether the calculation is done today, a few years earlier or a few years later.
3. If the average age of a family of  $n$  members is  $x$  today, after three years, the average age of the family will be  $x + 3$ .

## 5 Exponents

### Introduction

In the term  $x^2$ ,  $x$  is called the base and 2 is called the exponent. An exponent basically refers to the number of times the base is multiplied by itself. For example, in  $5^3$ , 5 is multiplied by itself 3 times, that is,  $5 \times 5 \times 5$ .

A number multiplied twice by itself is called the square of that number; so,  $4^2$  is 4 squared.

A number multiplied thrice by itself is called the cube of that number; so,  $4^3$  is 4 cubed.

### Rules of exponents

Exponent questions on the NMAT by GMAC™ will primarily test your knowledge of what rules to follow when working with exponents.

Let's look at these rules:

1. When multiplying two terms with the same base, add the exponents

$$2^2 \times 2^4 = 2^{(2+4)} = 2^6$$

2. When dividing two terms with the same base, subtract the exponents

$$2^7 \div 2^4 = 2^{(7-4)} = 2^3$$

3. When raising a power to another power, multiply the two exponents

$$(2^4)^3 = 2^{4 \times 3} = 2^{12}$$

4. A non-zero number raised to the power of zero is equal to 1

$$2^0 = 1$$

5. An exponential expression with base 0 and a positive exponent yields 0, regardless of the exponent

$$0^{12} = 0$$

6. An exponential expression with base 1 yields 1, regardless of the exponent

$$1^{12} = 1$$

7. An exponential expression with base -1 yields 1 when the exponent is even and -1 when the exponent is odd

$$(-1)^{15} = -1 \text{ and } (-1)^{16} = 1$$

8. When the base is a fraction between 0 and 1, the value decreases as the exponent increases

$$\left(\frac{1}{3}\right)^3 = \frac{1}{3} \times \frac{1}{3} \times \frac{1}{3} = \frac{1}{27}$$

which is smaller than the starting fraction,  $\frac{1}{3}$ .

9. When the base represents a product (multiplication) or quotient (division), we can choose to multiply or divide the base first, and then raise the base to the exponent or we can distribute the exponent to each number in the base

$$(3 \times 4)^2 = 12^2 = 144 \quad \text{or} \quad (3 \times 4)^2 = 3^2 \times 4^2 = 9 \times 16 = 144$$

10. A negative exponent indicates a reciprocal. Put the term containing the exponent in the denominator of a fraction and make the exponent positive

$$4^{-2} = \left(\frac{1}{4}\right)^2$$

11. If the exponent is a fraction, the numerator reflects what power to raise the base to and the denominator reflects which root to take

$$4^{2/3} = \text{cube root } (4^2) = \sqrt[3]{(4)^2}$$

## Roots/Radicals

Radical is the opposite of an exponent (in a sense). Radical is basically another name for a root. For example,  $\sqrt{25}$  means what number (or numbers), when multiplied by itself twice, will yield 25? The answer is, of course, 5.

Perfect square roots will yield an integer. For example,  $\sqrt{25} = 5$ . Imperfect square roots do not yield an integer.  $\sqrt{30}$  is not an integer, but it is between  $\sqrt{25}$  and  $\sqrt{36}$ , or between 5 and 6.

### Simplifying roots

In the case of positive terms, roots can be combined or split apart if the operation between the terms is multiplication or division.

$$\sqrt{(4 \times 9)} = \sqrt{4} \times \sqrt{9}$$

**Note:** If the operation between the terms is addition or subtraction, you cannot separate or combine the roots!  $\sqrt{(4 + 9)}$  does not equal  $\sqrt{4} + \sqrt{9}$ .



**Important Learning:**  $3^2 \times 3^4 = 3^6$

But,  $3^2 + 3^4 \neq 3^6$

## Powers of 10

The exponent of a power of 10 simply tells us the number of zeroes that number would contain if it were fully written.

$$10^7 = 1,00,00,000 \text{ (seven zeros)}$$



When multiplying a number by a power of 10, move the decimal point to the right the same number of places as that power.

$$0.00035 \times 10^4 = 3.5$$

When dividing a number by a power of 10, move the decimal point to the left the same number of places as that power.

$$0.35 \div 10^3 = 0.00035$$

## 6 Profit, Loss and Interest

### Introduction

Profit is an additional amount that a customer pays in return for buying an item that is owned by or sold by someone else.

$$\text{Profit} = \text{SP} - \text{CP}$$

where SP is the selling price, that is, the price at which the item is sold, and CP is the cost price, that is, the price at which it was originally manufactured or purchased by the seller.

When profit is expressed as a percentage of CP, it is known as profit %. Therefore,

$$\text{Profit \%} = \frac{(\text{SP} - \text{CP})}{\text{CP}} \times 100$$

Sometimes, the product is sold at a price lower than the CP. This is called loss.

Loss can be written either as  $(\text{CP} - \text{SP})$ , in which case it has a positive sign or  $(\text{SP} - \text{CP})$ , in which case it has a negative sign. So,  $\text{loss} = \text{SP} - \text{CP}$ .

$$\text{Loss \%} = \frac{(\text{SP} - \text{CP})}{\text{CP}} \times 100$$



**Important Learning:** Profit or loss % is always expressed as a percentage of the cost price.

### Important Points and Formulae

1. While the mark-up is always calculated as a percentage of the cost price, discount % is always calculated as a percentage of the marked price.
2. If two items are sold for Rs.  $x$  each, the first one at a profit of  $P\%$  and the other at a loss of  $P\%$ , then the overall loss will be  $= \left( \frac{P^2}{100} \right) \%$ .
3. When the CP and SP are either both increased or both decreased by the same percentage, there is no change in the existing profit % or loss %.

### Interest

Interest is an additional amount that a person gets against investment of capital. Interest earnings can be of two types: simple interest (SI) and compound interest (CI). Let us look at and understand each of them.

**Simple interest**

The basic formula for SI is

$$SI = \frac{(P \times R \times T)}{100}$$

where  $P$  is the principal,  $R$  is the rate % and  $T$  is the time period of investment.

**Compound interest**

CI is calculated on the principal amount and also on the accumulated interest of previous periods. This compounding effect can make a big difference to the total interest payable on a loan.

The following basic formula is used for calculating compound interest. The formula is used to calculate the amount and the amount can then be used to calculate the interest, that is,

$$A = P \left\{ 1 + \left( \frac{R}{100} \right) \right\}^n$$

where  $A$  is the amount,  $P$  is the principal,  $R$  is the rate % applicable and  $n$  is the number of periods.

**Compound interest calculation if interest is payable half-yearly or quarterly**

If interest is paid half-yearly,

$$A = P \left\{ 1 + \left( \frac{R}{200} \right) \right\}^{2n}$$

If interest is paid quarterly,

$$A = P \left\{ 1 + \left( \frac{R}{400} \right) \right\}^{4n}$$

**Important Points**

1. In the first period, SI and CI are equal. In all the other periods, after the first period, the CI is greater than the SI.
2. In SI, the total rate of interest applicable is the sum of all the respective rates applicable.
3. In CI, the total rate of interest applicable is the successive effect of the respective rates given.
4. The difference between the CI and SI at the end of two periods is because of the additional interest received on the first period's interest in case of CI.
5. The difference between the CI in any two consecutive periods is the additional interest received on the first period's interest.

## 7 Alligations and Mixtures

**Introduction**

In this chapter, we will cover the following two important topics and a variety of problems based on them:

1. Alligation
2. Replacement of part of a solution

## Alligation

Alligation is the mathematical process of finding out the resultant value when we mix two or more things having a common quality or property. This common quality or property of the constituents being mixed is called 'VALUE'.

Mathematically, there are three ways to look at an alligation problem and these are as follows:

1. Alligation is the process of weighted average presented in a different way, and therefore whatever is being discussed related to an alligation problem can also be calculated using the weighted average rule.

Weighted average rule:

$$\text{Weighted average of } x = w_1x_1 + w_2x_2 + \dots + w_nx_n$$

where

$w$  = relative weight

$x$  = value

2. If two things are being mixed, one of them is lower in VALUE. This constituent is called 'CHEAP'. The other one, which is higher in VALUE, is called 'DEAR'. The resultant obtained after the mixing is called the 'MEAN VALUE'.

*Rule of alligation*

$$\frac{\text{Amount or quantity of CHEAP}}{\text{Amount or quantity of DEAR}} = \frac{\text{Value of DEAR} - \text{MEAN VALUE}}{\text{MEAN VALUE} - \text{Value of CHEAP}}$$

3. Write down all the given information in a structured form.

We will consider an example to illustrate all the three ways:

**Example 1** 4 L of a 60% milk solution is mixed with 6 L of a 40% milk solution. Find the percentage of milk in the resultant mixture.

**Solution:**

Using weighted average:

$$4 \times 60\% + 6 \times 40\% = 10 \times y\%$$

$$240 + 240 = 10y$$

$$10y = 480 \Rightarrow y = 48\%$$

Using the rule of alligation: We need to understand that in order to use the rule of alligation, we need to first identify the 'CHEAP' and 'DEAR' solution. In this example, the constituent having 60% milk will be higher in quality and, therefore, called as DEAR. The quantity of DEAR is 4 L, while the quantity of CHEAP is 6 L. So,

$$\frac{6}{4} = \frac{60 - x}{x - 40}$$

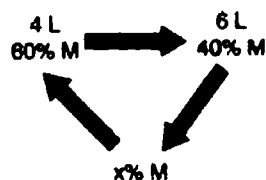
$$\frac{3}{2} = \frac{60 - x}{x - 40}$$

$$3x - 120 = 120 - 2x$$

$$5x = 240 \Rightarrow x = 48\%$$

**Using structured form:** It has been found that students either spend too much time or make mistakes in identifying 'CHEAP' and 'DEAR', and therefore, a third way to solve the problem is discussed as follows.

Start by quickly drawing a triangle of arrows representing the stated problem and attach quantities and percentages as shown below.



On the left-hand side, take the ratio in which the two constituents are being added, that is, 4 L and 6 L. After that, follow the arrow in the same direction and the right-hand side of the equation will be the differences taken, as shown

$$\frac{4L}{6L} = \frac{40 - x}{x - 60}$$

$$\frac{2}{3} = \frac{40 - x}{x - 60}$$

$$2x - 120 = 120 - 3x$$

$$5x = 240 \Rightarrow x = 48\%$$

A working like the one shown above may seem to be not directly aligned to the concept, but it helps a student in calculating a problem easily. We will refer to this method as the structured form for ease of understanding.



**Important Learning:** If two things are being added, it is easier to form the structure and use the rule of alligation to solve the problem. However, if more than two things are being added, it is better and easier to use the concept of weighted average to solve the problem.

## 8 Time, Speed and Distance

### Introduction

The basic concept of time, speed and distance is the relation between the three variables. The speed of a body is the distance covered by the body per unit time, that is,

$$\text{Speed} = \frac{\text{Distance covered}}{\text{Time taken}}$$

Most of the questions from this topic on the NMAT by GMAC™ will require you to work with some form of the above equation.

### Basic concepts

The basic concepts that form the fundamentals of time, speed and distance are:

1. In any problem, one has to ensure that speed, distance and time are in the same dimensions. The popular dimensions used for speed are km/h and m/s. If required, one can also convert one dimension into the other.

- To convert km/h into m/s, multiply km/h by  $\frac{5}{18}$  and to convert m/s to km/h, multiply m/s by  $\frac{18}{5}$ .
- 2. Distance covered is directly proportional to the speed if time of travel is constant.  
For constant time of travel,  $\frac{d_1}{s_1} = \frac{d_2}{s_2}$
- 3. Time taken is inversely proportional to the speed if distance is constant.  
For constant distance,  $s_1 \times t_1 = s_2 \times t_2$
- 4. Average speed =  $\frac{\text{Total distance travelled}}{\text{Total time}}$



**Important Learning:** When the total time of travel is divided into parts and the speed is different for each part, the average speed can be expressed as the weighted average of the individual speeds.

5. **Relative speed:** Relative speed is defined as the speed of a body with respect to another body. The possible cases of relative motion are:

- **Same direction:** If two bodies are moving in the same direction, the relative speed is the difference in their speeds and is always expressed as a positive value. Therefore, if two bodies are moving at  $x$  m/s and  $y$  m/s, then

$$\text{Relative speed} = |x - y| \text{ m/s}$$

The use of modulus sign above ( $| \quad |$  pipe) indicates that the relative speed will always be positive irrespective of the values of  $x$  and  $y$ .

- **Opposite direction:** If two bodies are moving in the opposite direction, the relative speed is the sum of their speeds. Therefore, if two bodies are moving in the opposite direction at  $x$  m/s and  $y$  m/s, then

$$\text{Relative speed} = (x + y) \text{ m/s}$$

### Problems on trains

Questions based on trains are commonly asked on the NMAT by GMAC™, and therefore, it is important to be familiar with them.

Consider that a train of length  $l$  is travelling at a speed of  $u$  m/s. Then, it is important to understand the following:

1. Time taken by the train to cross a man standing on a platform

$$t = \left( \frac{l}{u} \right) s$$

2. Time taken by the train to cross a man moving in the same direction at  $v$  m/s:

$$t = \left( \frac{l}{u - v} \right) s$$

3. Time taken by the train to cross a man moving in the opposite direction at  $v$  m/s:

$$t = \left( \frac{l}{u + v} \right) s$$

4. Time taken by the train to cross a platform of length  $P$ :

$$t = \left( \frac{l + P}{u} \right) s$$

5. Time taken by two trains of lengths  $l_1$  and  $l_2$  and speeds  $u$  and  $v$  m/s to cross each other while travelling in the opposite direction:

$$t = \left( \frac{l_1 + l_2}{u + v} \right) s$$

### Problems on boats and streams

The concept of boats and streams is exactly opposite to the concept of relative speed.

Let  $u$  m/s be the speed of the boat in still water and  $v$  m/s be the speed of the river/stream.

We will talk about two situations here:

1. Speed of the boat against the direction of the stream: Speed upstream =  $(u - v)$  m/s
2. Speed of the boat in the direction of the stream: Speed downstream =  $(u + v)$  m/s

$$\text{Speed downstream} + \text{Speed upstream} = 2u$$

Therefore,

$$u = \frac{\text{Speed downstream} + \text{Speed upstream}}{2}$$

$$v = \frac{\text{Speed downstream} - \text{Speed upstream}}{2}$$

### Problems on circular motion

1. In case of circular motion, if two people are travelling in the same direction, they will meet for the first time after the start when the faster person covers one more complete round than the slower person.
2. In case of circular motion, if two people are travelling in the opposite direction, they will meet for the first time after the start when they would have together covered one complete round.
3. In case of both the above mentioned points, the two people will again meet at the starting point after a time, which is equal to the LCM of the time taken by each to complete one round.

## 9 Time and Work

### Introduction

The problems of time and work can primarily be divided into two types. The first type is the problem where individuals work with different efficiencies either alone or in combination to complete a task. The second type is where group efficiencies are involved. Such types of problems are also known as problems that use the chain rule.

The NMAT by GMAC™ will test you on both of these types of problems.

### Problems involving individual efficiencies

In such questions, the rates at which some individuals complete a work alone is given and you are required to calculate the rate at which they can complete the work together (or vice versa). The basic formula for solving such problems is

$$\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$$

where  $a$  and  $b$  are the time it takes the two individuals to complete a job, while working alone and  $c$  is the number of hours it takes them to complete the job working together. Let us look at an illustration to understand this concept better.

**Example 1** A can do a work in 20 days. B can do the same work in 30 days. In how many days can A and B do the work together?

**Solution:**

**Unitary method:** We have been solving such problems using the unitary method.

A can do a work in 20 days. Therefore, in 1 day, A will be able to do  $\frac{1}{20}$  of the work.

B can do the same work in 30 days. Therefore, in 1 day, B will be able to do  $\frac{1}{30}$  of the work.

Both of them together can do  $\left(\frac{1}{20} + \frac{1}{30}\right)$  of the work in 1 day =  $\frac{5}{60}$  of the work in 1 day.

Therefore, the entire work will be completed in  $\frac{60}{5}$  days, that is, 12 days.

**LCM method:** An easier method to do such problems is to understand and use a method called the LCM method.

Let the total work be 60 units, where a unit is a simple measurement of work.

Total work = 60 units.

A can do 60 units in 20 days, that is, 3 units per day.

B can do 60 units in 30 days, that is, 2 units per day.

Together, they are able to do  $3 + 2$ , that is, 5 units per day.

Therefore, they will finish the work in  $\frac{60}{5}$ , that is, 12 days.

With a little practice, the LCM method can be effectively used to solve a problem.



**Important Learning:** While using the LCM method, it is not necessary to use the LCM of the individual time taken to do the problem. One can take any convenient value and solve the problem.

### Pipes and cisterns

Problems on pipes and cisterns are common and popular applications of work-related problems. The only difference being that in the case of pipes and cisterns there can be a contribution that is against the work to be completed. In such a situation, the particular contribution(s) needs to be taken with a negative sign.

**Example 2** Pipe A can fill a tank in 4 h, while a leak can empty the tank in 6 h. If the tank is empty and both, the pipe and the leak, are opened, in how much time will the tank be full?

**Solution:** Let the total work be 12 units.

Pipe A = 3 units/h

Leak = -2 units/h

Combining both, we can find out that 1 unit will get filled in the tank per hour.

Therefore, entire tank will get filled in 12 h.

### Problems involving group efficiencies

We will now look at problems where people with the same efficiencies are working in groups. Let us try to understand this with the help of an example.

**Example 3** If 20 men, working for 6 h a day, can complete a piece of work in 35 days, in how many days can 15 men working for 7 h a day complete the same work?

**Solution:** The easiest way to solve such problems is to equate the total work to be done. Therefore, the total work is  $20 \times 6 \times 35$ .

It is the same as  $15 \times 7 \times Y$ , where  $Y$  is the number of days. So,

$$20 \times 6 \times 35 = 15 \times 7 \times Y$$

$$Y = 40 \text{ days}$$

## 10 Clocks

### Introduction

The concept of clocks is the same as the concept of circular motion. Just like in circular motion, in case of clocks, the hour hand and the minute hand are continuously racing against each other around a circle.

### Concept of clocks

The hour hand travels 5 min or  $30^\circ$  in 1 h. Similarly, the minute hand travels 60 min or  $360^\circ$  in 1 h.

Therefore, in one hour, the minute hand moves 55 min or  $330^\circ$  more than the hour hand. This can also be called the relative speed between the minute hand and the hour hand.

Concept of clocks			
Actual Time (min)	Movement		Relative Movement
	Minute Hand	Hour Hand	
60	60 min	5 min	55 min
60	$360^\circ$	$30^\circ$	$330^\circ$

The information presented in the table above is the aspect on which all problems of clocks are based and is to be used as per the problem type. Different types of problems based on clocks are illustrated as follows.



## Type 1

**Example 1** At what time between 4 pm and 5 pm will the two hands of a clock coincide?

**Solution:** Usually, the reaction to a problem like this will be 4.20 pm, but please remember that in case of clocks the answer has to be accurate because all the options given will be close to 4.20 pm. Therefore, an approximate answer will not be sufficient. We need to accurately determine the time in this case.

We will start our problem from 4 pm. At 4 pm, the minute hand is behind the hour hand by 20 min. Therefore, to coincide, the minute hand has to take a lead of 20 min over the hour hand, or the minute hand has to cover 20 min more or 20 min relative to the hour hand.

As per the concept given in table above, the minute hand is able to cover a lead of 55 min in 60 min of actual time.

Therefore, 11 min more can be covered in 12 min of actual time. And so, 1 min more can be covered in actual time of  $\frac{12}{11}$  min of actual time.

Therefore, 20 min can be covered in  $\frac{(20 \times 12)}{11}$  or  $\left(\frac{240}{11}\right) = 21.81$  min past 4 pm.

**Do not commit this common error:** The time is not 4.21 pm and 81 s. It is 0.81 of a minute.  $0.81 \times 60 =$  approximately 48 s.

Therefore, the time between 4 pm and 5 pm when the two hands of a clock coincide will be approximately 4.21 pm and 48 s.

## Type 2

**Example 2** What is the angle between the two hands of a clock at 4.40 pm?

**Solution:** In a problem like this, we will take a reference time at which the position of both the hands can be exactly determined. This reference time should be as close to the given time as possible. In example, we will take the reference time as 4.30 pm.

Now at 4.30 pm (the time of reference), the angle between the two hands of the clock is  $45^\circ$  with the minute hand ahead of the hour hand.

As the problem is about the angle between the two hands of the clock, we will use the relative speed in degree terms.

The minute hand covers  $360^\circ$  in 60 min or  $6^\circ/\text{min}$ .

The hour hand covers  $30^\circ$  in 60 min or  $0.5^\circ/\text{min}$ .

Therefore, in every minute, the minute hand is able to cover  $5.5^\circ$  more than the hour hand.

At 4.30 pm, the minute hand is ahead by  $45^\circ$ . In the next 10 min, that is, up to 4.40 pm, it will further extend this angle by  $5.5 \times 10$ , that is,  $55^\circ$ .

Therefore, the angle between the two hands at 4.40 pm =  $45^\circ + 55^\circ = 100^\circ$ .

### Type 3

**Example 3** At what time between 3 pm and 4 pm will the angle between the two hands of a clock be equal to  $50^\circ$ ?

**Solution:** At 3 pm, the angle between the two hands of a clock is  $90^\circ$ . When the minute hand reduces this lead by  $40^\circ$ , the angle will be  $50^\circ$ .

Also, when the minute hand covers the existing gap of  $90^\circ$  and takes a further lead of  $50^\circ$ , the angle between the two hands will become equal to  $50^\circ$ .

Therefore, an example like the one above will have two possible answers (times) at which the angle between the two hands becomes equal to  $50^\circ$ .

(a) The first position will be when the minute hand moves  $40^\circ$  more than the hour hand.

$5.5^\circ$  more will be covered by the minute hand in 1 min.

$1^\circ$  more will be covered in  $\frac{1}{5.5} = \frac{10}{55} = \left(\frac{2}{11}\right)$  min.

Therefore,  $40^\circ$  more will be covered in  $\frac{(40 \times 2)}{11} = \frac{80}{11}$  min past 3 pm = 7 and  $\frac{3}{11}$  min past 3 pm.

(b) The second position will be when the minute hand moves  $90^\circ + 50^\circ = 140^\circ$  more than the hour hand.

$140^\circ$  more will be covered in  $\frac{(140 \times 2)}{11} = \frac{280}{11} = 25$  and  $\frac{5}{11}$  min past 3 pm.



**Important Learning:** Will there always be two answers to an example like the one above? It will depend on the angle asked in the question being more than the angle existing at the reference point or less than the angle existing at the reference point.

If the angle asked in the question is less than the angle existing at the reference point, there will be two answers; if the angle asked in the question is more than the angle existing at the reference point, there will be only one position and therefore one answer.

### Other important concepts of clocks

1. The two hands of a clock coincide once every hour, but in 12 h they coincide only 11 times. This is because of a single common position between 11 am and 1 pm. Between 11 am and 1 pm there must be two positions at which the hands coincide. There is only one position of 12 noon or 12 midnight which is common to and counted in both 11 to 12 and 12 to 1.
2. The hands are at right angles twice in every hour, but in 12 h they are at right angles only 22 times. This is because of one common position between 2 pm and 4 pm and another common position between 8 pm and 10 pm. Between 2 pm and 4 pm there must be four right-angle positions. There are only three right-angle positions because the right angle at 3 pm is common to and counted in both 2 pm to 3 pm and 3 pm to 4 pm. Similarly, the right-angle position at 9 pm is common to both 8 pm to 9 pm and 9 pm to 10 pm.
3. The hands point in the opposite direction once in every hour, but in 12 h they are opposite only 11 times. This is because the opposite position of 6 pm is common to and counted in both 5 pm to 6 pm and 6 pm to 7 pm.

4. The hands are said to be in the same straight line whenever they are coincident or opposite to each other.
5. If the two hands of a clock coincide once, after how much time will they again coincide? If they coincide once, they will coincide again when the minute hand takes a lead of 60 min on the hour hand.

As per the concept, the minute hand takes a lead of 55 min in 60 min of actual time.

Therefore, to cover 1 min, it will require  $\left(\frac{60}{55}\right)$  or  $\frac{12}{11}$  min of actual time.

To cover 60 min more, it will require  $60 \times \left(\frac{12}{11}\right) = \frac{720}{11} = 65$  and  $\frac{5}{11}$  min of actual time.



**Important Learning:** The two hands of every correct clock will coincide after every 65 and  $\frac{5}{11}$  min of actual time—another reason for the two hands to coincide only 11 times in 12 h.

$\frac{720}{11}$  or 65 and  $\frac{5}{11}$  min is a standard value for every correct clock and therefore will be used in the problems on incorrect clocks.

### Concepts of incorrect clocks

An incorrect clock can either be a fast clock which gains time or a slow clock which loses time.

#### Fast clock

The two hands of a clock coincide every  $x$  minutes where  $x$  is less than  $65 + \frac{5}{11}$  min. This is an example of a fast clock and therefore it will gain time.

$$\text{Time gained per minute} = \frac{[(65 + 5/11) - x]}{x}$$

Using this equation, the time gained can be calculated per hour or per day as the case may be.

#### Slow Clock

The two hands of a clock coincide every  $x$  minutes where  $x$  is greater than  $65 + \frac{5}{11}$  min. This is an example of a slow clock and therefore it will lose time.

$$\text{Time lost per minute} = \frac{[x - (65 + 5/11)]}{x}$$

Some problems based on incorrect clocks are discussed as follows.

### Type 4

#### Example 4

The two hands of an incorrect clock coincide after every 65 min. How much time does the clock gain or lose in one day?

#### Solution:

Time gained by the clock in one minute

$$\frac{[(720/11) - 65]}{65} = \frac{720 - 715}{65 \times 11}$$

Time gained by the clock in one day

$$\frac{5}{65 \times 11} \times 60 \times 24 = 10.069 \text{ min gain in 1 day}$$

**Example 2** The two hands of an incorrect clock coincide after every 70 min. How much does the clock gain or lose per hour?

**Solution:** Time lost by the clock in one minute

$$\frac{[70 - (720/11)]}{70} = \frac{(50/11)}{70} = 0.064 \text{ min in 1 min of actual time}$$

Time lost by the clock in 60 min =  $0.064 \times 60 = 3.896$  min

## 11 Calendars

### Introduction

The topic of calendar includes concepts such as odd days and leap year and finding the day of the week for a given date.

### Concept of odd days

An ordinary year has 365 days, that is, 52 weeks and one odd day. This means, out of the 365 days in an ordinary year, 364 days will get converted into 52 weeks and one day will remain. This one day is referred to as 1 odd day.

Whenever we will have the case of certain number of days in our calculations, we will convert the days into weeks by dividing the total number of days by 7 and the remainder will be the number of odd days.


*How the day of the week for the same date shifts from one year to the next*

The concept of odd days means that when we proceed from one year to the next and the year is ordinary, that is, it has 365 days, the day will get shifted by one day.

As an example, if the 24th of May 2014 is a Saturday, then 24th of May 2015 will be a Sunday while 24th of May 2013 would have been a Friday and so on.

A leap year has 366 days, that is, 52 weeks and two odd days. This means that when we proceed from one year to the next and the year has the effect of leap (29th February being included), and the year has 366 days, the day would get shifted by two days.

As an example, if the 24th of May 2015 is a Sunday, then 24th of May 2016 would be a Tuesday, that is, a shift of two days.

 **Do not commit this common error:** Normally, students make the mistake of only looking at the years (from which year to which year) to decide whether the shift will be one day or two days. This is a wrong approach. When calculating the above, we need to look at not only the years but also the date from which we are moving to the other given date. If the 29th of February falls between the two dates, there will be a shift of two days, otherwise there will be a shift of one day.

### Definition of a leap year

Normally, we define a leap year by saying that a year if divisible by 4 is a leap year, and if not, then an ordinary year. This definition is unfortunately not complete. The correct definition of a leap year is as follows:

*An end of the century year (the last year of a century, e.g. 1900, 2000, 2100, etc.) is a leap year only if divisible by 400. For all the other years, check the divisibility by 4, and if the year is divisible by 4 it is said to be a leap year and will have 366 days.*

This would mean that the year 1900 in spite of being divisible by 4 was not a leap year and the year 2100 will also not be a leap year.



**Important Learning:** Do you know why an end of the century year has to be divisible by 400 to be a leap year? This is because the revolution of the Earth around the Sun, which is normally said to be 365.25 days, which is what leads to an additional day being added in February, is actually 365.242 days.

Therefore, when we take 365.25 days in each year in our calculations, we are introducing an error of approximately 0.008 days in our calendar every year.

This error of 0.008 days does not seem very significant when viewed alone, but when its effect is taken for 400 consecutive years, it will introduce an error of 3 complete days in our calendar.

Therefore, it was decided that if the above mentioned error is to be corrected, then we need to add 3 days less in every 400 years, and so the 100th, 200th and 300th year are not leap years in spite of being divisible by 4. This error correction has also meant that after every 400 years, our calendar repeats itself for the next 400 years.

### Counting odd days

1st January AD from where our calendar started was a Monday, and hence the reason for our week starting on a Monday, and Saturday and Sunday being called as weekends.

Therefore, if we are calculating from 1st January AD and after converting into weeks, whenever we have 1 odd day left, it would be a Monday. If there are 2 odd days left, then the first one would be a Monday, the second a Tuesday and so on. So, after converting into weeks,

First odd day = Monday

Second odd day = Tuesday

Third odd day = Wednesday

Fourth odd day = Thursday

Fifth odd day = Friday

Sixth odd day = Saturday

Seventh or zeroth odd day = Sunday

### Concept of total odd days in 100, 200, 300 and 400 years

The total number of odd days form the basis of these calculations:

1. If we take 100 consecutive years from 1st January AD, there will be 24 leap years (remember the 100th year will not be a leap year) and 76 ordinary years.  
 $24 \text{ leap years} = 24 \times 2 = 48 \text{ odd days}$ , that is, 42 days being converted into 6 weeks and 6 odd days

76 ordinary years =  $76 \times 1 = 76$  odd days, that is, 70 days being converted into 10 weeks and 6 odd days.

Total =  $6 + 6 = 12$  odd days, that is one week and 5 odd days.


So, 100 consecutive years from 1st January AD will give 5 odd days.

2. Similarly, 200 consecutive years from 1st January AD = 10 odd days, that is, 3 odd days.
3. 300 consecutive years will be 15 odd days, that is, 1 odd day.
4. But, 400 consecutive years =  $20 + 1$ , that is, 21 odd days, that is, 0 odd days. (This is because the 400th year will be a leap year and contribute 1 extra day.)

Also, any multiple of 400 consecutive years will always give 0 odd days. This is used along with the other four concepts to calculate a day if a date is given.

5. Also, 100 consecutive years will have 5 odd days, that is, the last day of 100 years will be a Friday. Similarly, the last day of the 200th, 300th and the 400th years will be Wednesday, Monday and Sunday, respectively.

Any two years will have the same calendar if they are both of the same type (that is, both ordinary or both leap) and the first days of both the years are the same.

 **Important Learning:** The last day of a century will definitely be one day out of Friday, Wednesday, Monday or Sunday. Continuing with the same logic, the first day of a new century will be a Saturday, Thursday, Tuesday or Monday.

## Problem types based on calendars

### Type 1

**Example 1** What was the day on 24th May 2014?

**Solution:** In such questions, it would always depend on whether we have a reference point or not. As we do not have a reference point in this case, we will start our calculations from 1st January AD.

The first 2,000 years = 0 odd days

Next 13 years will have:

3 leap years  $\times$  2 odd days = 6 odd days

10 ordinary years  $\times$  1 odd day = 10 odd days = 3 odd days

For the year 2014:

January: 31 days, 3 odd days

February: 28 days, 0 odd days

March: 31 days, 3 odd days

April: 30 days, 2 odd days

May: 24 days, 24 odd days = 3 odd days

Total number of odd days for the year 2014 =  $3 + 0 + 3 + 2 + 3 = 11$  odd days = 4 odd days

Total odd days =  $6 + 3 + 4 = 13$  odd days = 6 odd days

Thus, 24th May 2014 will be a Saturday.

**Example 2** What was the day on 27th January 1973?

**Solution:** First 1600 years = 0 odd days

Next 300 years = 1 odd day

Now we have 72 complete years, which will have 18 leap years and the remaining 54 ordinary years.

54 ordinary years =  $54 \times 1 = 54$  odd days, that is, 5 odd days.

18 leap years =  $18 \times 2 = 36$  odd days, that is, 1 odd day.

For 1973, we don't need to calculate the number of odd days in the entire year since we are only interested in the period up to the 27th of January.

Total number of odd days =  $1 + 5 + 1 + 6 = 13$  odd days, that is, 6 odd days.

Therefore, 27th of January will be the sixth odd day, that is, a Saturday.





## 2.5 Algebra

## 2.6 What is Measured?

The Algebra section will test you on topics such as equations and inequalities. You will be required to solve linear equations with one unknown and two unknowns, calculate the roots of a quadratic equation and work with the concept of absolute value.

Algebra is also tested indirectly in word problems as most of these questions will require you to make an equation and solve it.

You will also be tested on the expression of common algebraic identities such as  $(a + b)^2$ ,  $(a - b)^2$  and so on.

## 2.7 Overall Test Taking Strategies

- As algebra is mostly formula-driven, you should be familiar with all the commonly used formulae.
- If you make any change to one side of an equation or inequality, remember to make that same change to the other side as well.
- Remember to reverse the inequality sign when changing a positive number into a negative number or vice versa.
- A lot of the algebra questions are best tackled through the answer choices. Instead of finding the actual answer, it may be faster to back-solve from the answer choices, especially if you are able to eliminate one or two choices at first glance.

The next few sections will provide you with in-depth strategies for approaching each topic.

# 1 Linear Equations

## Introduction

While arithmetic primarily deals with numbers, the basic building block of algebra is a variable which does not have a fixed value.

A variable along with a constant forms the basis of algebra. A variable by itself or a constant by itself or a variable in combination with a constant forms a term in algebra. For example,  $x^3$  will be a term, 8 is also a term,  $5x^2$  is also a term and so on.

When many terms combine together, they form an expression. For example,  $x^3 - 5x^2 + 11$  is an expression in variable  $x$ . Please note that an expression is different from an equation. While an expression does not include the '=' sign, an equation will always include an '=' sign. Moreover, an expression always has a value while an equation has roots or a solution.

## Basis of classification

Algebraic expressions can be classified in the following ways:

1. **Number of terms:** The first basis of classification of algebraic expressions is based on the number of terms in the expression.
  - An expression having a single term is called a monomial, for example,  $5x^2y$ . Please note that the number of variables does not make any difference as long as the term is single.
  - An expression having two terms is called a binomial. For example,  $3x + 5$ .
  - An expression having more than two terms is called a polynomial. For example,  $5x + 2y - 6$ .
2. **Degree of the expression:** Before we understand this, we need to understand the definition of degree. Degree is defined as the highest or maximum sum of the powers of all the variables in any term of the expression.

For example,

$$3x^3 + 2x^2yz - 7y^2 + 5yz - 15x + 17$$

- The degree of this expression will be 4 because in the term  $2x^2yz$ , the power of  $x = 2$ , power of  $y = 1$ , power of  $z = 1$ . Hence the degree will be  $2 + 1 + 1 = 4$ .
- An expression of degree 1 is called linear.
- An expression of degree 2 is called quadratic.
- An expression of degree 3 is called cubic and so on.

**Note:** The NMAT by GMAC™ will not test any skills beyond quadratic equations.

## Linear equations

As stated earlier, an expression of degree 1 is called a linear equation. In this type of equation, all the variables are raised to the first power only (there are no squares, cubes, etc.). For example,

$$x + 10 = 25$$


In order to solve linear equations, we try to isolate the variable whose value we are trying to find by bringing it on one side of the equation and taking all other values to the other side of the equation. So, in the above equation

$$x + 10 - 25 = 0$$

$$x = 25 - 10 \text{ (isolating } x \text{ by taking 10 to the other side)}$$

$$x = 15 \text{ (the solution to the equation)}$$

We can always verify whether we have got the correct answer by replacing the value of  $x$  (that we have arrived at) in the original equation and checking if it holds true.

 **Important Learning:** To solve a linear equation, you just need to isolate the variable on one side and take all the numbers on the other side. Remember to reverse the signs when changing sides.

## 2 Simultaneous Equations

### Introduction

In linear equations, we were working with one variable, namely  $x$ . In simultaneous equations, we will be working with two variables, namely  $x$  and  $y$ .


### Simultaneous equations

Let us look at this equation

$$3x + 4y = 24$$

From this equation, can you find the values of  $x$  and  $y$ ? Obviously not!

As a rule, if you want to find the numerical value for  $N$  variables, you will need  $N$  different equations. In linear equations, we are trying to find the value of one variable, so a single equation is sufficient. However, in the above equation, we are trying to find the values of two variables  $x$  and  $y$ , so we need two different equations that we will combine and solve simultaneously.

 **Important Learning:** To find the numerical value for  $N$  variables, we need  $N$  number of equations.

Let us say we have the following two equations given to us,

$$x + 6y = 9 \quad (1)$$

$$3x + 4y = 24 \quad (2)$$

We can isolate  $x$  in Eq. (1) as

$$x = 9 - 6y$$

and we can then substitute this value of  $x$  in Eq. (2)

$$3(9 - 6y) + 4y = 24 \quad (3)$$

We can then solve Eq. (3) as a normal linear equation to get the value of  $y$  as  $\frac{3}{14}$ . We can then substitute this value of  $y$  in either Eq. (1) or Eq. (2) to find the value of  $x$ .

$$x + 6 \times \frac{3}{14} = 9$$

$$\Rightarrow x = \frac{54}{7}$$

### 3 Quadratic Equations

#### Introduction

An equation of the form  $ax^2 + bx + c = 0$ , where  $a$ ,  $b$  and  $c$  are real and  $a \neq 0$ , is called a quadratic equation.

#### How to solve a quadratic equation

The following two methods are used to solve a quadratic equation:

1. **Method of factorisation:** This is the most popular method of solving a quadratic equation. If  $ax^2 + bx + c = 0$  is the equation, we divide  $b$  into two parts such that their sum is  $b$  and product is  $ac$ .

For example, consider the equation  $x^2 + 5x + 6 = 0$ .

Now, 5 has to be divided into two numbers such that their product = 6 and their sum is 5.

Therefore,

$$x^2 + 2x + 3x + 6 = 0$$

$$x(x + 2) + 3(x + 2) = 0$$

$$(x + 3)(x + 2) = 0$$

$$x = -3, -2$$

2. **Shridharacharya's method:** This is the method through which we all learnt the solution of quadratic equations for the first time. If  $ax^2 + bx + c = 0$  is the equation, then

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

where  $(b^2 - 4ac)$  is known as  $D$ , the discriminant of the equation, which also decides the nature of the roots of the quadratic equation, as follows:

- If  $D > 0$ , the roots are real and unequal.
- If  $D = 0$ , the roots are real and equal.
- If  $D < 0$ , the roots are imaginary.



**Important Learning:** The solutions to a quadratic equation are technically called its roots. The relation between the roots of an equation is the same as the relation between the variables of the equation.

#### Properties of quadratic equations

1. If  $ax^2 + bx + c = 0$  is the equation and the two roots are  $\alpha$  and  $\beta$ , then

$$\alpha + \beta = \text{Sum of the roots} = -\frac{b}{a}$$

$$\alpha\beta = \text{Product of the roots} = \frac{c}{a}$$

2. If we know the roots, we can find the equation using

$$x^2 - (\text{sum of roots})x + \text{product of roots} = 0$$

## 4 Inequalities

### Introduction

While equations tell us that two parts of an equation are equal, inequalities tell us that one part is bigger or smaller than the other.

$$2x + 3 < 7$$

Inequalities basically give us an idea of the relative size of two values.

### How to solve an inequality

An inequality is solved, in the same way as you solve an equation, by isolating the variable on one side and simplifying it. It is just that the sign used will not be the '=' sign but the inequality sign, depending on the relation between the two parts of the inequality.

1.  $>$  greater than
2.  $<$  less than
3.  $\geq$  greater than or equal to
4.  $\leq$  less than or equal to

So, the solution to the inequality  $2x + 3 < 7$  is  $x < 2$ .

However, there is one major difference between equations and inequalities that needs to be kept in mind—if the inequality is multiplied or divided by a negative number, the sign of the inequality is reversed.

For example, if the inequality  $-5x > 3$  is multiplied by  $-1$ , the resulting inequality is

$$5x < -3$$



**Important Learning:** If an inequality is multiplied or divided by a negative number, the sign of the inequality gets reversed.

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## 2.8 Geometry and Mensuration

## 2.9 What is Measured?

Geometry consists of topics such as Lines, Angles, Triangles, Polygons, Circles and some Three-Dimensional Figures.

You will be tested on your ability to visualise different shapes and identify patterns such as a triangle within a square or a square within a circle.

You will also be tested on the application of common geometric theorems such as Pythagoras theorem, Base angle theorem, Longest side theorem, etc.

## 2.10 Overall Test Taking Strategies

- Geometry is all about shapes, so the best way to handle geometry problems is to draw the figure and then visually analyse the problem.
- Do not assume anything about a given figure that is not explicitly written or mentioned. Thus, even if an angle looks like a right angle, do not assume it is so, unless explicitly stated.
- Remember the properties of special triangles such as 45-45-90 and 30-60-90 triangles.
- While attempting questions on circles, always try to calculate the radius first. Everything else will follow from there.
- While working with squares and rectangles, try to break them up into triangles by making the diagonals.

The next few sections will provide you with in-depth strategies for approaching each topic.



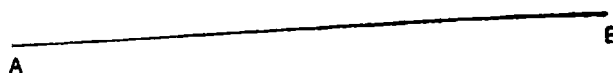
# 1 Lines and Angles

## Introduction

Geometry is a branch of mathematics that deals with measurement of various parameters of geometric figures. The concept of geometry is based, to a large extent, on the understanding of different shapes in terms of the length of their sides, their degree measures, etc.

## Lines

A line is a one-dimensional figure—it only has length but no width or thickness. It can be extended indefinitely in both directions; thus, a line is infinite. A finite line, that is, a line having two end points, is called a line segment. It is named after its end points, such as line AB in the figure below:



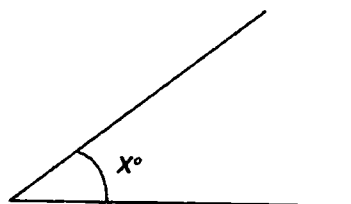
A line segment



**Important Learning:** The shortest distance between two points is always a straight line.

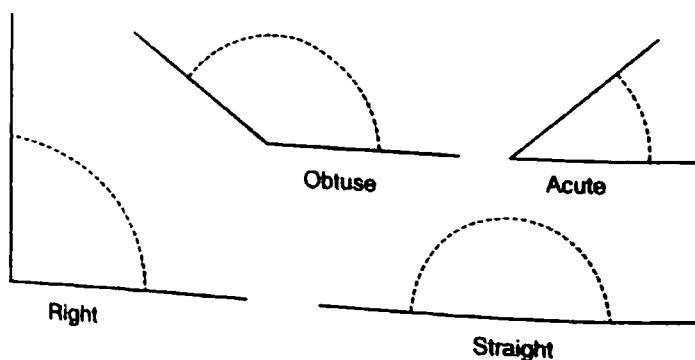
## Angles

An angle ( $\angle$ ) is formed when two lines meet at a point. This meeting point is called the vertex. Angles are measured in degrees ( $^\circ$ ). An angle of  $x^\circ$  can be seen in the figure below.



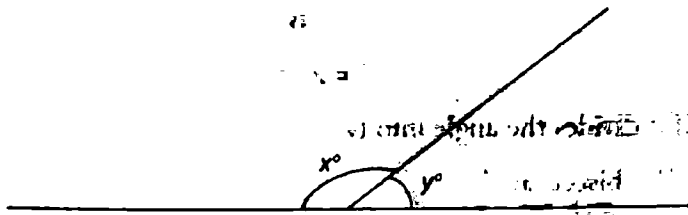
Angle  $x$

An acute angle measures between  $0^\circ$  and  $90^\circ$ . A right angle measures exactly  $90^\circ$ . An obtuse angle measures between  $90^\circ$  and  $180^\circ$ . An angle of  $180^\circ$  is a straight line. These angles can be seen in the figure below.



Types of angles

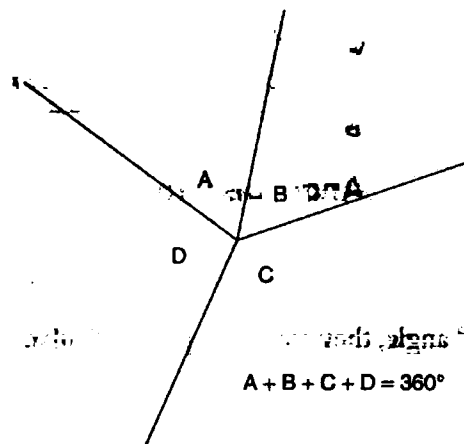
The sum of measures of the angles on a straight line is always  $180^\circ$  as shown in the figure below.



### Sum of measures of angles on a straight line

In the above figure,  $\angle x + \angle y = 180^\circ$

Similarly, the sum of measures of an angle around a point is always  $360^\circ$ , as shown in the figure below.



### Sum of measures of angles around a point

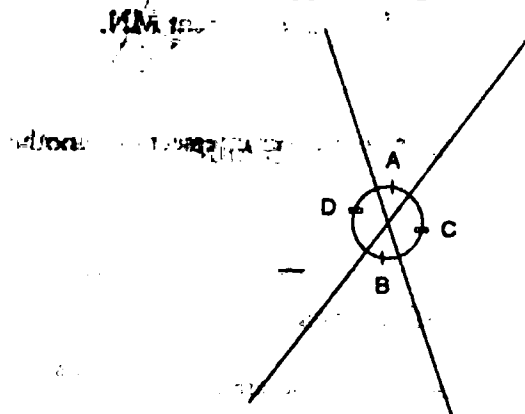
Two angles are congruent if their measures are equal.

Supplementary angles add up to  $180^\circ$ .

Complementary angles add up to  $90^\circ$ .

### Intersecting lines

When two lines intersect each other, the opposite angles have the same measure called vertical angles.



### Angles formed by intersecting lines

In the figure above,

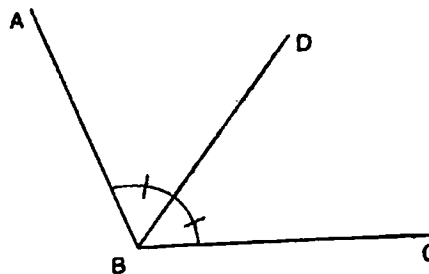
$$\angle A = \angle B$$

$$\angle C = \angle D$$

A line bisects an angle if it divides the angle into two equal parts.

In the figure below, line BD bisects angle ABC.

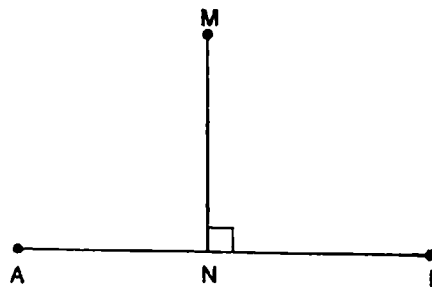
Thus,  $\angle ABD = \angle CBD$



Angle bisector

### Perpendicular lines

When two lines intersect at a  $90^\circ$  angle, they are called perpendicular.



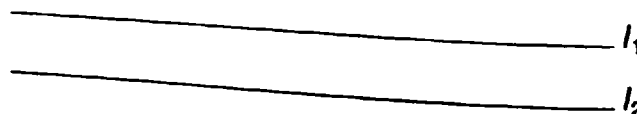
$AB \perp MN$

### Perpendicular lines

In the figure above, line segment AB is perpendicular to line segment MN.

### Parallel lines

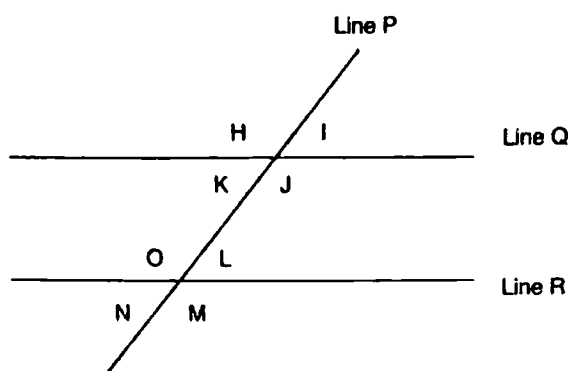
Parallel lines are two lines that lie in the same plane but never intersect one another.



### Parallel lines

Lines  $l_1$  and  $l_2$ , in the figure above, are said to be parallel and are denoted as  $l_1 \parallel l_2$ .

If two parallel lines intersect a third line (called a transversal), each of the parallel lines will intersect the third line at the same angle, that is, all acute angles will be equal, all obtuse angles will be equal and any acute angle will be supplementary to any obtuse angle.



Transversal *P* intersecting parallel lines *Q* and *R*

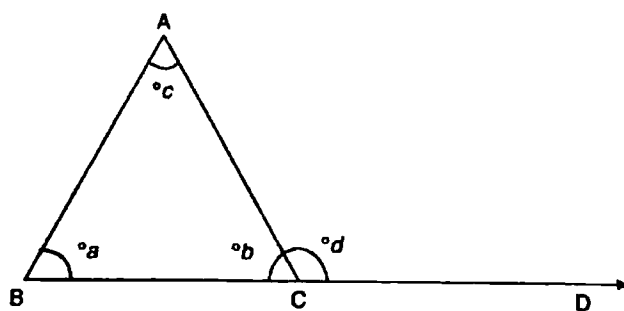
Thus, in the figure above,

1.  $\angle H = \angle J = \angle O = \angle M$
2.  $\angle I = \angle K = \angle L = \angle N$
3.  $\angle H + \angle I = \angle K + \angle J = \angle O + \angle L = \angle N + \angle M = 180^\circ$

## 2 Triangles

### Introduction

A triangle is a closed figure with three straight sides and three angles. It is denoted by the symbol  $\Delta$ . The sum of interior angles of a triangle is always  $180^\circ$ . Also, the measure of each exterior angle of a triangle is equal to the sum of the interior opposite angles.



Sum of angles of a triangle

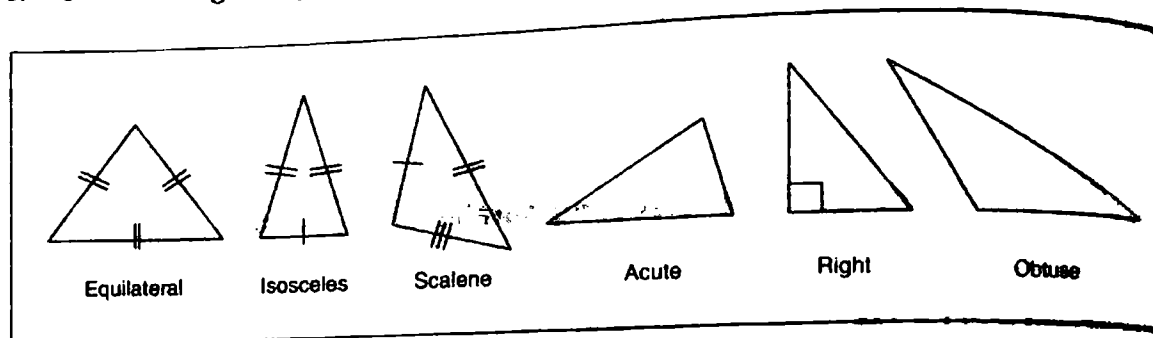
Thus, in the figure above,

$$\angle a + \angle b + \angle c = 180^\circ$$

$$\angle a + \angle c = \angle d$$

## Types of triangles

1. **Scalene triangle:** None of the three sides are equal.
2. **Isosceles triangle:** Two of the sides (and angles) are equal.
3. **Equilateral triangle:** All three sides (and angles) are equal.
4. **Right triangle:** One of the angles is  $90^\circ$ .
5. **Acute triangle:** All three angles are less than  $90^\circ$ .
6. **Obtuse triangle:** Any one angle is greater than  $90^\circ$ .



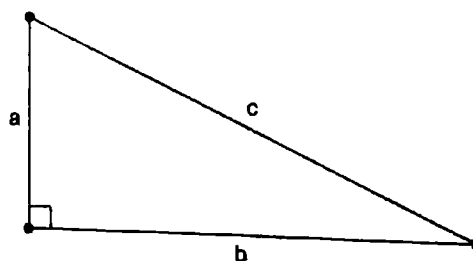
## Types of triangles

### Length of the sides of a triangle

The length of any one side of a triangle is less than the sum of lengths of the other two sides and greater than the difference between the lengths of the other two sides.

### Pythagoras theorem

Pythagoras theorem applies only to right triangles and states that in a right triangle the square of the hypotenuse (the longest side) is equal to the sum of squares of the other two sides, as illustrated in figure below.



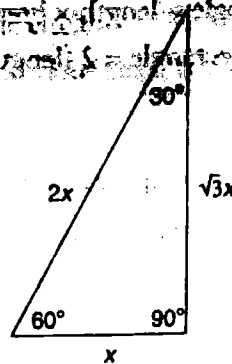
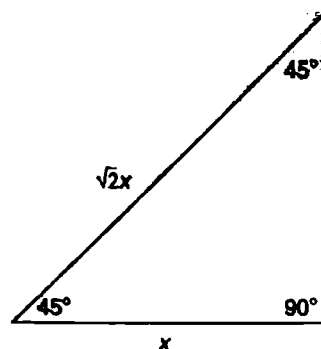
$$a^2 + b^2 = c^2$$

### Pythagoras theorem

There are two special types of right triangles commonly tested on the NMAT by GMAC™ whose sides always have the same ratio.

These are illustrated in the figure below.

1. 45-45-90 or Isosceles right-angled triangle
2. 30-60-90 triangle



### Special triangles



**Important Learning:** In 45-45-90 and 30-60-90 triangles, if you know the length of any one side, you can calculate the length of the other two sides.

### Area and perimeter of a triangle

Area of a  $\Delta = \frac{1}{2} \times \text{base} \times \text{height}$

Perimeter of a  $\Delta = \text{sum of lengths of its sides}$

### Important concepts related to triangles

1. The largest angle in a triangle lies opposite to the longest side, the second largest angle lies opposite to the second longest side and the smallest angle lies opposite to the shortest side.
2. If two triangles are similar, their sides and angles are in the same proportion.
3. If two triangles are congruent, their corresponding angles have the same measure and corresponding sides have the same length.

## 3 Quadrilaterals

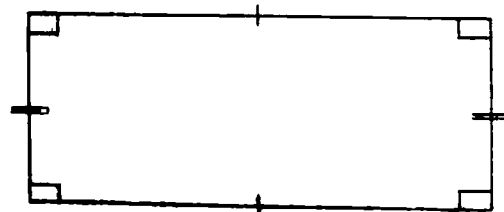
### Introduction

A quadrilateral is a figure enclosed by four sides. The sum of interior angles of a quadrilateral is always  $360^\circ$ .

Rectangles and squares are the most important quadrilaterals from the NMAT by GMAC™ perspective.

### Rectangle

A rectangle, as shown in the figure below, is a quadrilateral with all four angles equal to  $90^\circ$ . The opposite sides of a rectangle have equal length and the diagonals also have equal length.



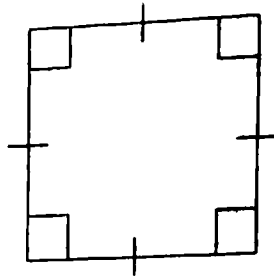
Rectangle

1. Area of a rectangle = length  $\times$  breadth
2. Perimeter of a rectangle = 2 (length + breadth)

### Square

A square, as shown in the figure below, is basically a rectangle with all sides equal.

1. Area of a square =  $s^2$  (side squared)
2. Perimeter of a square =  $4s$  (4 times side)



Square



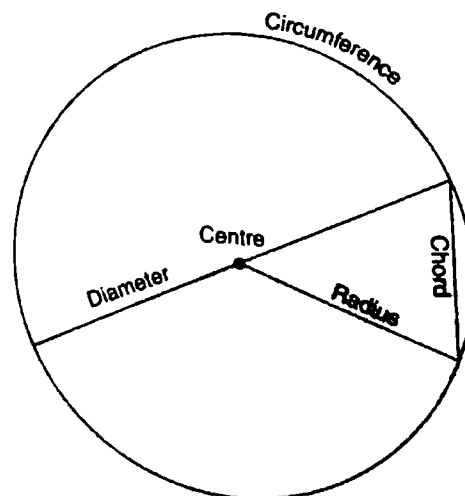
**Important Learning:** All squares are rectangles but all rectangles are not squares.

## 4 Circles

### Introduction

Technically, a circle is the set of all points in a plane which are equidistant from a certain point, called the centre of the circle.

### Important concepts related to circles

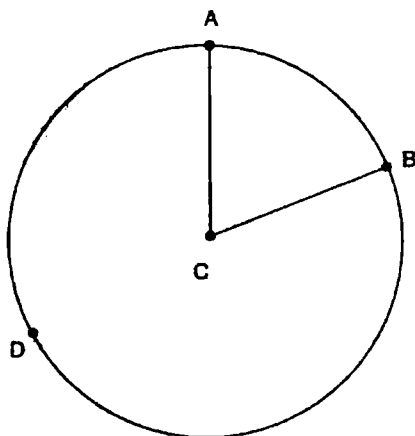


Parts of a circle

1. **Chord:** A chord is a segment whose end points lie on the circle.
2. **Diameter:** The diameter, as shown in the figure on the previous page, is the line segment connecting two points on the circle which passes through the centre of the circle. The diameter is the longest chord in a circle.
3. **Radius:** The distance between the centre of a circle and any point on the circle is called the radius. It is basically half of the diameter.
4. **Circumference:** The distance around the outer boundary of a circle is called its circumference. It is the same as the perimeter of the circle.

$$\text{Circumference, } C = 2\pi r$$

5. **Area of a circle:**  $A = \pi r^2$
6. **Tangent:** A tangent is a line that touches the circle at any one point on its circumference. A line-drawn tangent to a circle is perpendicular to the radius at the point of tangency.
7. **Arc:** An arc is a portion of the circumference of a circle. In the figure below, AB is an arc of the circle. The shorter distance between A and B is called the minor arc and the longer distance (via D) is called the major arc. An arc that is exactly half the length of the circumference is called a semicircle.



**Arc of a circle**

The ratio of the length of an arc to the circumference of a circle is the same as the ratio of the angle subtended by the arc at the centre of the circle to  $360^\circ$ . This is also the same as the ratio of the area of the arc to the area of the entire circle. So,

$$\frac{\text{Length of arc AB}}{\text{Circumference}} = \frac{\angle ACB}{360} = \frac{\text{Area of sector ACB}}{\text{Area of circle}}$$

This is a commonly tested concept on the NMAT by GMAC™, so make sure you are clear on its application.



**Important Learning:** The longest line that can be drawn inside a circle is the same as its diameter.

### Key points to remember

1. The perpendicular from the centre of the circle to a chord bisects the chord.
2. Equal chords of a circle are equidistant from the centre.



3. The angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.
4. A triangle drawn inside a circle, whose one side is the diameter of the circle, is always a right triangle.
5. When a square is inscribed in a circle, the diagonal of the square is the same as the diameter of the circle.
6. When a circle is inscribed in a square, the diameter of the circle is the same as the side of the square.

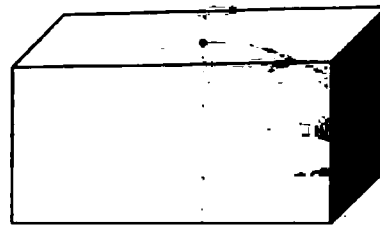
## 5 Three-Dimensional Figures or Mensuration

### Introduction

Mensuration is a branch of Mathematics that deals with measurement of various parameters of geometric figures. The concept of mensuration is based on the understanding of the formulae and their applications. Therefore, it is very important to know the formulae for solving problems in mensuration.

### Cuboid

A cuboid is a three-dimensional figure having different length, breadth and height (see the figure below).



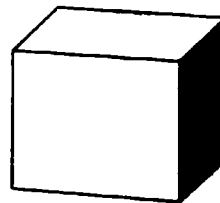
A cuboid

Following are the important formulae related to a cuboid. The dimensions of a cuboid are the length, breadth and height denoted by  $l$ ,  $b$  and  $h$ , respectively.

1. Volume =  $l \times b \times h$
2. Total surface area =  $2(lb + bh + lh)$
3. Length of the longest diagonal (body diagonal) of the cuboid =  $\sqrt{l^2 + b^2 + h^2}$
4. Area of the four walls =  $2(lh + bh)$

### Cube

A cube is a three-dimensional figure having length, breadth and height all equal (see the figure below).



A cube

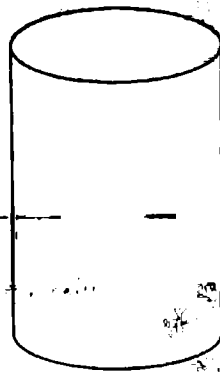
Following are the important formulae related to a cube. The dimension of a cube is the side of the cube denoted by  $l$ .

1. Volume =  $(\text{Side})^3$  or  $l^3$ , where  $l$  is the side of the cube

2. Total surface area =  $6l^2$
3. Length of the longest diagonal =  $l \times \sqrt{3}$
4. Length of the body diagonal =  $l \times \sqrt{2}$

### Cylinder

A cylinder is a three-dimensional figure having a height or length denoted by  $h$  and the radius of the base denoted by  $r$  (see the figure below).



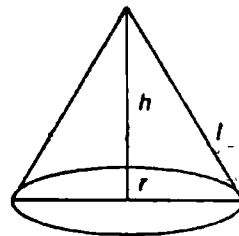
A cylinder

Following are the important formulae related to a cylinder. The dimensions of a cylinder are the radius of the base and its height denoted by  $r$  and  $h$ , respectively.

1. Volume =  $\pi r^2 h$
2. Curved surface area =  $2\pi r h$
3. Total surface area =  $2\pi r^2 + 2\pi r h$

### Cone

A cone is a three-dimensional figure having a height denoted by  $h$ , a slant height denoted by  $l$  and a radius of the base denoted by  $r$  (see the figure below).



A cone

Following are the important formulae related to a cone. The dimensions of a cone are the radius of the base and its height denoted by  $r$  and  $h$ , respectively.

1.  $l^2 = r^2 + h^2$
2. Volume =  $\frac{1}{3} \pi r^2 h$
3. Curved surface area =  $\pi r l$
4. Total surface area =  $\pi r^2 + \pi r l$

## Sphere

Following are the important formulae related to a sphere. The dimension of a sphere is its radius denoted by  $r$ .

1. Volume =  $\frac{4\pi r^3}{3}$
2. Surface area =  $4\pi r^2$

## Problems based on different geometric figures



**Important Learning:** In all the problems where any three-dimensional figure is melted or dug out and cast into or poured into or filled into another three-dimensional figure, it is the total volume that has to be made equal.

**Example 1** What is the total surface area of a cuboid whose length, breadth and height are 5 cm, 10 cm and 20 cm, respectively?

**Solution:** Total surface area =  $2(lb + bh + lh)$ . So,

$$2(5 \times 10 + 10 \times 20 + 5 \times 20) = 2(50 + 200 + 100) = 2 \times 350 = 700 \text{ cm}^2$$

**Example 2** Find the curved surface area of a cylinder of length 14 cm and radius of base 5 cm.

**Solution:** Curved surface area of a cylinder =  $2\pi rh$ , where  $\pi = \frac{22}{7}$ . Hence

$$\frac{2 \times 22 \times 5 \times 14}{7} = 22 \times 20 = 440 \text{ cm}^2$$

**Example 3** Find the total cost of painting the four walls of a room of length 12 cm, breadth 5 cm and height 15 cm at 2.5/cm<sup>2</sup>.

**Solution:** Area of the four walls of a cuboid =  $2(lh + bh)$

So the area of the four walls of the room

$$2(12 \times 15 + 5 \times 15) = 2 \times 255 \text{ cm}^2$$

Painting cost = Rs. 2.5/cm<sup>2</sup>

$$\text{Total cost of painting} = \frac{2 \times 255 \times 2.5}{2} = \text{Rs. } 1,275$$

**Example 4** A pit of dimensions 20 cm × 15 cm × 9 cm is dug and the soil is taken to fill a land of dimensions 12 cm × 18 cm. By how much will the height be increased?

**Solution:** In this problem, the total volume of soil dug out has to be equal to the landfill. Let the height be increased by  $y$  cm. Therefore,

$$20 \times 15 \times 9 = 12 \times 18 \times y \Rightarrow y = 12.5 \text{ cm}$$

**Example 5** What is the total surface area of a cone where slant height  $l$  is 13 cm and radius of the base is 5 cm?

**Solution:** The relation between  $l$ ,  $r$  and  $h$  is

$$l^2 = r^2 + h^2$$

Substituting the given values, we have

$$169 = 25 + h^2$$

$$h^2 = 144 \Rightarrow h = 12 \text{ cm}$$

Now,

$$\begin{aligned} \text{Total surface area} &= \pi r(r + l) \\ &= \frac{22}{7} \times 5(18) \\ &= \frac{1980}{7} \text{ cm}^2 = 282.85 \text{ cm}^2 \end{aligned}$$

## 2.11 Modern Math

## 2.12 What is Measured?

Modern math includes advanced topics such as Permutation and Combination, Probability and Coordinate Geometry.

You will be tested on the fundamental rule of counting and when to use addition and when to use multiplication within the same.

You will also be tested on the expression of formulae such as  ${}^nP_r$ ,  ${}^nC_r$ , equation of a line and its slope, etc.

## 2.13 Overall Test Taking Strategies

- These are difficult questions, so attempt them after you have attempted everything else.
- Read the question carefully and decide whether you are looking at a permutation question or a combination question.
- Try to put the factorial sign in the numerator and denominator in such a manner that you can cancel out a lot of the numbers.
- While attempting coordinate geometry questions, draw the coordinate plane and mark the points given in the question on it so that it becomes easier for you to visualise the problem.

The next few sections will provide you with in-depth strategies for approaching each topic.

# 1 Permutation and Combination

## Introduction

Permutation and combination are two of the most logical topics in mathematics, and their applications can be observed and verified in real-life situations.

## Fundamental principle of counting

The concepts in permutation and combination are based on the fundamental principle of counting, which in turn comprises the rule of multiplication and the rule of addition. These are listed as follows:

1. **Rule of multiplication:** If a certain task can be done in  $m$  ways and after having done it, another can be done in  $n$  ways, then the total number of ways in which the two tasks can be done together is  $m \times n$ .

Thus, if there are three ways of going from A to B and four ways of going from B to C, then the number of ways of going to C from A via B =  $3 \times 4 = 12$  ways.

2. **Rule of addition:** If a certain task can be done in  $m$  ways and another can be done in  $n$  ways, then either of the two tasks can be done in  $m + n$  ways.

Thus, when tasks A and B both have to be completed, we multiply, but when either A or B has to be completed, we add.



**Important Learning:** Whenever the concept in the question is the same as 'and' we will use multiplication and whenever the concept is same as 'or' we will use addition.

## Combination

Combination means selection only, that is, in combination, we are only interested in the selection of things and not in their arrangement.

In general, the number of combinations of  $n$  different things taken  $r$  at a time is given by  ${}^nC_r$ , where

$${}^nC_r = \frac{n!}{r!(n-r)!}$$

where  $n!$  (read as  $n$  factorial) =  $n \times (n-1) \times (n-2) \times \dots \times 4 \times 3 \times 2 \times 1$

Thus,

$$0! = 1 \text{ (by definition)}$$

$$1! = 1$$

$$2! = 2 \times 1$$

$$3! = 3 \times 2 \times 1 \text{ and so on}$$

Let us try to understand the concept of combination by taking an example.

**Example 1** There are four fruits, an apple, a mango, a banana and an orange, and we need to select two fruits out of these four fruits. In how many ways can we do this?

**Solution:** Number of ways of selecting two fruits from four fruits is  ${}^4C_2$ , that is,

$$\frac{4!}{2! \times (4-2)!} = \frac{24}{4} = 6$$

that is, six different ways, which will be AM, AB, AO, MB, MO and BO.

### Rules of combination

1.  ${}^nC_0 = 1$  way (there is only one way to select 0 things out of  $n$  different things).
2.  ${}^nC_n = 1$  way (there is only one way to select  $n$  things out of  $n$  different things).
3.  ${}^nC_1 = n$  ways (there are  $n$  ways to select one thing out of  $n$  different things).
4.  ${}^nC_r = {}^nC_{n-r}$  (the number of ways of selecting  $r$  things out of  $n$  different things is the same as identifying those  $(n-r)$  things that will not be selected).

### Combination of $N$ different things taken 0 or some or all at a time

The number of combinations of  $n$  different things taken 0 or some or all at a time is:

$${}^nC_0 + {}^nC_1 + {}^nC_2 + {}^nC_3 + \dots + {}^nC_n$$

The above expression is the binomial expansion of  $(1 + 1)^n = 2^n$

Therefore,

$${}^nC_0 + {}^nC_1 + {}^nC_2 + {}^nC_3 + \dots + {}^nC_n = 2^n$$

### Permutation

While a combination deals only with selection, permutation is selection and arrangement both, that is, in permutation, we are not only interested in selecting the things, but we also take into consideration the number of possible arrangements of the selected things.

The permutation of  $n$  different things taken  $r$  at a time is

$${}^nP_r = \frac{n!}{(n-r)!}$$

The concept of permutation is illustrated in the following example.

**Example 2** Suppose there are four children in a group. Find the number of ways in which any two children out of the four can be arranged for a photograph.

**Solution:** We need to select two children out of the four, and then arrange them. So, we need to take the permutation of four different things, taken two at a time.

$$\begin{aligned} {}^4P_2 &= \frac{4!}{(4-2)!} \\ &= \frac{24}{2} \\ &= 12 \text{ ways} \end{aligned}$$

### Permutation of $N$ different things taken all at a time

The permutation of  $n$  different things taken all at a time is

$${}^nP_n = \frac{n!}{(n-n)!} = \frac{n!}{0!} = n!$$



This is the result of selecting  $n$  things out of  $n$  given things, and then arranging them. But, if  $n$  things are being selected out of  $n$  things, then selection will be possible in only one way and so the result obtained, that is,  $n!$  is entirely due to the arrangement of the selected things.

This leads to a very important result of permutation, that is,  $n$  different things can be arranged in a straight line in  $n!$  ways.

For example, if four students are to be arranged in a straight line for a photograph, the total number of ways of doing so is  $4! = 4 \times 3 \times 2 \times 1 = 24$  ways.

#### Permutation of identical things

This refers to the number of permutations of  $n$  things taken all at a time. Here,  $p$  things are alike of one kind,  $q$  of second kind,  $r$  of third kind and so on. The permutation is given by

$$\frac{n!}{p! \times q! \times r!}$$

that is, divide by the factorial of the number of identical things.

The concept is illustrated by means of the following example.

**Example 3** In how many different ways can the letters of the word ARRANGE be arranged?

**Solution:** Total number of ways =  $\frac{7!}{2! \times 2!} = 1,260$  ways

#### Circular permutation

The total number of ways in which  $n$  different things can be arranged in a circle =  $(n - 1)!$  ways.

For example, if three people are to be seated on a circular table for dinner, the number of ways of doing so is  $(3 - 1)! = 2$  ways.



**Important Learning:** If there are  $n$  different things, they can be arranged in a circle in  $(n - 1)!$  different ways.

#### Distribution

**Case 1:** Different things to be distributed to different groups.

In how many ways can five different balls be distributed in three different boxes?

**Solution:** The first ball can go into any of the three boxes, and therefore, the first ball can be distributed in three ways. Having done this, the second ball can be distributed in three ways and so on.

Therefore, the five balls can be distributed in  $3 \times 3 \times 3 \times 3 \times 3 = 3^5$  ways or 243 ways.

**Case 2:** Identical things to be distributed to different groups.

In how many ways can five identical balls be distributed in three different boxes?

**Solution:** Five identical balls have to be distributed in three different boxes. If space has to be divided into three boxes, we can do so by using two partitions.

Now, one of the possible arrangements will be  $\frac{bbb}{bb}$ , that is, three balls in the first box, two balls in the second box and no balls in the third box.

Other possible arrangements can be:

$$1. \frac{bb}{bbb}$$

0

$$2. \frac{b}{bbb}$$

b

$$3. \frac{b}{bb}$$

bb

$$4. \frac{b}{b} \text{ and so on}$$

bbb

If you observe closely, we are arranging and rearranging seven things in a straight line, out of which five (balls) are identical of one type and two (partitions) are identical of another type.

Thus, required number of ways =  $\frac{7!}{5! \times 2!} = 21$  ways

## 2 Probability

### Introduction

Probability is defined as the chance of happening of an event and is a measure of the likelihood that an event will occur. It is used to quantify an attitude of mind towards some proposition of whose truth we are not certain. The certainty we adopt can be described in terms of a numerical measure and this number, between 0 and 1 (where 0 indicates impossibility and 1 indicates certainty), is called probability.

Thus, the higher the probability of an event, the more certain we are that the event will occur. A simple example would be the toss of a fair coin. As the two outcomes are deemed equiprobable, the probability of 'heads' equals the probability of 'tails', and each probability is  $\frac{1}{2}$  or equivalently a 50% chance of either 'heads' or 'tails'.

In many ways, the concept of probability can be said to be an extension of the concepts of permutation and combination.

In examples and problems where the event is described, the basis of solving the problem happens to be the classical definition of probability, which says

$$\text{Probability of an event E, denoted by } P(E) = \frac{\text{Number of favourable outcomes}}{\text{Total number of outcomes}}$$

where the favourable number of outcomes or cases is as defined in the problem under the given set of conditions and the total number of outcomes or cases is the number of ways of doing the task without any condition being applicable.

### Elements of probability

1. **Scope:** Probability is always defined for the future.

2. **Random experiment:** A random experiment is an experiment, trial or observation that can be repeated numerous times under the same conditions. The outcome of an individual random experiment must be independent and identically distributed. It must in no way be affected by any previous outcome and cannot be predicted with certainty.
3. **Sample space:** The total number of ways in which an event can happen is called the sample space of the event.
  - **Sample space for toss of coins:**
    - (a) Tossing a coin: two elements (H or T)
    - (b) Tossing two coins: two elements  $\times$  two elements = four elements (HT, TH, TT, HH)
    - (d) Tossing three coins: two elements  $\times$  two elements  $\times$  two elements = eight elements  
(HHH, HHT, HTH, THH, TTT, TTH, THT, HTT)
  - **Sample space for throwing one or more dice:**
    - (a) Throw a dice: six elements (1, 2, 3, 4, 5, 6)
    - (b) Throw two dice: 36 elements [(1, 1), (1, 2), (1, 3)...(1, 6), (2, 1), (2, 2)...(2, 6) and so on (6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)]
4. **Range of probability of any event:** As the number of favourable outcomes cannot be greater than the total number of outcomes, therefore  $0 \leq P(E) \leq 1$ , that is, probability of any event will always lie between 0 and 1.



**Important Learning:** The range of probability of any event will always lie between 0 and 1, inclusive.

5. **Any event will either happen or not happen:**  $P(E) + P(\sim E) = 1$ , that is, sum of the probability of happening of an event and the probability of its not happening = 1.
6. **Odds for and against an event:** It is not necessary that a problem will always provide probabilities. There are examples where odds in favour of an event or odds against an event are provided.

$$\text{Odds in favour of an event} = \frac{\text{Number of favourable outcomes}}{\text{Number of unfavourable outcomes}}$$

$$\text{Odds against an event} = \frac{\text{Number of unfavourable outcomes}}{\text{Number of favourable outcomes}}$$

7. **Mutually exclusive events:** Any two events are said to be mutually exclusive events if they cannot occur together.

For two mutually exclusive events A and B

$$P(A \text{ or } B) = P(A) + P(B)$$

and if the events are not mutually exclusive, then

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

In these expressions,  $P(A \text{ or } B)$  represents the probability of either event A happening or event B happening.

8. **Independent events:** Any two events where the probability of happening of one event is not dependent on the other are said to be independent events.

For two independent events A and B,

$$P(A \text{ and } B) = P(A) \times P(B)$$

The above result will be true for any number of independent events.

For three independent events A, B and C

$$P(A, B \text{ and } C) = P(A) \times P(B) \times P(C)$$

9. **Pack of cards:** Problems related to a pack of cards are frequently asked as a part of questions on probability. In case of a pack of cards, remember the following:

- A pack has 52 cards, which get divided into 13 cards each of four different types or variety.
- These 13 cards are (Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, K and Q) and the four types are Hearts, Diamond, Spade and Club. Technically, these four types are called suits. So, in a normal pack of cards, there will be four aces, four ones, four twos and so on, thus, making a total of 52 cards.
- King, Queen and Jack are also popularly known as face cards. A pack of cards will, therefore, have 12 face cards.

### 3 Progression

#### Introduction

A series in which a particular relation exists between the terms is called a progression. There are three types of progressions: arithmetic progression (AP), geometric progression (GP) and harmonic progression (HP).

For the NMAT by GMAC™, you need to focus on AP and GP.

#### Arithmetic progression

Popularly known as AP, it is a series of terms in which the difference between a term and the next term is constant. This difference is called the common difference of the AP and is denoted by  $d$ .

Some examples of AP are:

1. 2, 4, 6, 8, 10, 12, 14, ...
2. -3, -6, -9, -12, -15, -18, ...
3. 1, 2, 3, 4, 5, 6, 7, 8, ...
4.  $\frac{1}{2}, 1, \frac{3}{2}, 2, \frac{5}{2}, 3, \frac{7}{2}, 4, \dots$

#### Properties of AP

The first term is called  $a$ , the common difference is called  $d$  and the number of terms is denoted by  $n$ . Therefore, an AP would be like  $a, a + d, a + 2d, a + 3d, a + 4d$  and so on. Some important properties of AP are listed below:

1. The  $n$ th term of an AP is given by  $T_n = a + (n - 1)d$ , a relation between the  $n$ th term, the first term, the common difference and the number of terms.
2. If the same quantity (positive or negative) is added to each term of an AP, the series will continue to be an AP.
3. If the same quantity (positive or negative) is multiplied with or divides each term of an AP, the series will continue to be an AP.

4. In an AP, the sum of the terms equidistant from the beginning and end is a constant and is equal to the sum of the first and last terms. Let us try to understand this with the help of an example:

3, 6, 9, 12, 15, 18, 21, 24 is an AP

- Sum of the first and last terms =  $3 + 24 = 27$
- Sum of the second and second last terms =  $6 + 21 = 27$
- Sum of the third and third last terms =  $9 + 18 = 27$
- Sum of the fourth and fourth last terms =  $12 + 15 = 27$

What if the number of terms is odd?

Let us try to understand this with the help of another example:

4, 7, 10, 13, 16, 19, 22 is an AP

- Sum of the first and last terms =  $4 + 22 = 26$
- Sum of the second and second last terms =  $7 + 19 = 26$
- Sum of the third and third last terms =  $10 + 16 = 26$
- The middle term in this case, which does not form a pair, will be half the sum of the first and last terms.

5. Sum to  $n$  terms of an AP:

$$S_n = \frac{n}{2}(a + l)$$

where  $l$  is the last term, in this case the  $n$ th term of the AP, and  $l = T_n = a + (n - 1)d$   
Substituting for  $l$ , we get

$$S_n = \frac{n}{2}[2a + (n - 1)d]$$

One can use either of the above formulae to find the sum to  $n$  terms of an AP.

6. Three consecutive terms in an AP will be  $a - d$ ,  $a$  and  $a + d$ .
7. Four consecutive terms in an AP will be  $a - 3d$ ,  $a - d$ ,  $a + d$  and  $a + 3d$ .
8. Five consecutive terms in an AP will be  $a - 2d$ ,  $a - d$ ,  $a$ ,  $a + d$  and  $a + 2d$ .
9. Sum of first  $n$  natural numbers =  $\frac{n(n+1)}{2}$ .
10. Sum of squares of first  $n$  natural numbers =  $\frac{n(n+1)(2n+1)}{6}$ .
11. Sum of cubes of first  $n$  natural numbers =  $\left[\frac{n(n+1)}{2}\right]^2$ .
12. If  $a$ ,  $b$  and  $c$  are in an AP, then  $b$  is the arithmetic mean of the three numbers.



**Important Learning:** In an AP, the sum of the terms equidistant from the beginning and end is a constant and is equal to the sum of the first and the last terms.

## Geometric progression

GP refers to a series in which the ratio of a term to its previous term is constant. This ratio is called the common ratio of the GP and is denoted by  $r$ .

Some examples of GP are:

1. 2, 4, 8, 16, 32, 64, ...
2.  $\frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \frac{1}{81}, \dots$
3. -2, 4, -8, 16, -32, 64, ...

### Properties of GP

The first term is called  $a$ , the common ratio is  $r$  and the number of terms is denoted by  $n$ . Therefore, a GP would be like  $a, ar, ar^2, ar^3, ar^4$  and so on.

Some important properties of a GP are listed below:

1. The  $n$ th term of a GP denoted by  $T_n$  is given by  $T_n = ar^{(n-1)}$ .
2. If a constant term (positive or negative) is multiplied with or divides each term of a GP, the series continues to be a GP.
3. Sum to  $n$  terms of a GP is given by

$$S_n = \frac{[a(r^n - 1)]}{r - 1}$$

4. Three consecutive terms in GP will be  $\frac{a}{r}$ ,  $a$  and  $ar$ .
5. Four consecutive terms in GP will be  $\frac{a}{r^3}$ ,  $\frac{a}{r}$ ,  $ar$  and  $ar^3$ .
6. If  $a, b$  and  $c$  are in GP, then

Then,  $b$  is called the geometric mean (GM) of  $a$  and  $c$ . GM of three numbers  $a, b$  and  $c$  is the cube root of the product of the three numbers.

$$\begin{aligned}\frac{b}{a} &= \frac{c}{b} \\ b^2 &= ac \\ b &= \sqrt{ac}\end{aligned}$$

Then,  $b$  is called the geometric mean (GM) of  $a$  and  $c$ . GM of three numbers  $a, b$  and  $c$  is the cube root of the product of the three numbers.

## Harmonic Progression

A series of terms is said to be in Harmonic Progression (HP) if the reciprocal of the terms are in AP. As an example, if  $a, b$  and  $c$  are in HP, then  $\frac{1}{a}$ ,  $\frac{1}{b}$  and  $\frac{1}{c}$  will be in AP. Therefore,

$$\begin{aligned}\frac{1}{b} - \frac{1}{a} &= \frac{1}{c} - \frac{1}{b} \\ \frac{2}{b} &= \frac{1}{a} + \frac{1}{c} = \frac{a+c}{ac} \\ b &= \frac{2ac}{(a+c)}\end{aligned}$$

where  $b$  is called the harmonic mean (HM) of  $a$  and  $c$ .

## 4 Set Theory

### Introduction

A set is defined as a group or collection of objects having similar properties. The objects are called elements of the set and are represented by small alphabets while the set itself is represented by capital letters. Also, the number of distinct elements of the set is called the cardinal number of the set.

### Representation of a set

There are two basic ways to represent a set:

1. **Tabular or Roster method:** In this method, all the elements of the set are shown or represented within a curly bracket and separated by a comma.

For example,  $\{a, e, i, o, u\}$  is the set of all vowels in the English language.

Similarly,  $\{1, 3, 5, 7, 9\}$  is the set of all odd natural numbers less than 10.

2. **Set-builder method:** In this method, the elements of the set are not shown. Instead, the rule or criteria to form or build the set are provided.

For example,  $B = \{b: b \text{ is a vowel of the English language}\}$ .

### Venn diagrams

The idea of representing a set and solving set-based questions on the basis of a diagram was first suggested by Swiss mathematician Euler and was later developed by British mathematician Venn. So, the diagram representing a set is known as Euler-Venn diagram or simply Venn diagram. A Venn diagram uses a closed curve, generally an oval or a circle, to represent a set.

### Types of sets

1. **Empty set or Null set:** A set having zero element or no element is called a null set or empty set or void set represented by  $\{\}$  or  $\Phi$ .
2. **Singleton set:** A set having a single element is called a singleton set.
3. **Universal set:** A set which is the combination of all possible sets under consideration is called the universal set.
4. **Equivalent sets:** Any two sets having the same number of elements, that is, the same cardinal number are called Equivalent sets.

For example, Set  $A$  is the set of all the vowels in the English language while Set  $B$  is the set of all the odd numbers less than 10. Then

$$\text{Set } A = \{a, e, i, o, u\}$$

$$\text{Set } B = \{1, 3, 5, 7, 9\}$$

Set  $A$  and Set  $B$  are called equivalent sets.

5. **Equal sets:** Two sets  $A$  and  $B$  are said to be equal sets if every element of  $A$  is also an element of  $B$  and vice versa.

For example, if Set  $A = \{a, c, b\}$  and Set  $B = \{c, b, a\}$ ,  $A$  and  $B$  will be known as equal sets.

### Subset of a set

Set  $A$  is said to be a subset of Set  $B$  if every element of  $A$  belongs to  $B$ . Also, If  $A$  is a subset of  $B$ , then  $B$  is called the superset of  $A$ .

Subsets are of two types, listed as follows:

1. **Proper subset:** If every element of  $A$  belongs to  $B$  but there is at least one element in  $B$  which does not belong to  $A$ , then  $A$  is called a proper subset of  $B$ . This is represented by  $A \subset B$ .
2. **Improper subset:** If  $A$  is a subset of  $B$  and  $A$  is also equal to  $B$ , then  $A$  and  $B$  are called improper subsets of each other. This is represented by  $A \subseteq B$ .

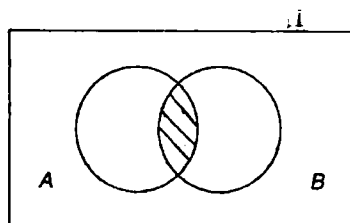
Some important properties of subsets:

1. Every set is a subset of itself.
2. Null set is a subset of all sets.
3. Universal set is a superset of all sets.
4. If the cardinal number of a set is  $n$ , then the number of subsets  $= 2^n$ . Out of these, one subset is an improper subset while the remaining  $(2^n - 1)$  subsets are proper subsets.

### Operations on sets

The following operations have been defined on sets:

1. **Union of sets:** Denoted by  $A \cup B$ , it is the set of all those elements that belong to Set  $A$  or to Set  $B$ . For example, if Set  $A = \{2, 3, 5, 7, 9\}$  and Set  $B = \{1, 3, 5, 6, 8\}$ , then  $A \cup B = \{1, 2, 3, 5, 6, 7, 8, 9\}$
2. **Intersection of sets:** Denoted by  $A \cap B$ , it is the set of all those elements that belong to set  $A$  and also to set  $B$ .

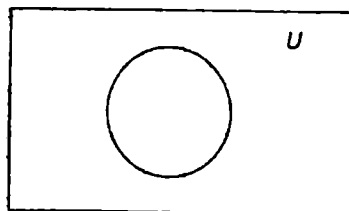


The shaded region in the above figure denotes the intersection of Sets  $A$  and  $B$ . In the example above,  $A \cap B = \{3, 5\}$

If  $A \cap B$  is a null set, then  $A$  and  $B$  are said to be disjoint sets.

3. **Complement of a set:** Denoted by  $\sim A$ , it is the set of all those elements that belong to the universal set ( $U$ ) but are not present in set  $A$ .

As an example, let Set  $A$  be the set of all the single digit natural numbers and let Set  $B = \{2, 3, 5, 7\}$ , then the complement of Set  $B$  denoted by  $\sim B = \{1, 4, 6, 8, 9\}$



4. **Difference of two sets:** Denoted by  $A - B$ , it is the set of all those elements that belong to  $A$  but not to  $B$ .

Let Set  $A$  be defined as  $A = \{2, 7, 9, 11, 13, 14, 17, 19\}$  and Set  $B = \{2, 5, 8, 11, 12, 15, 17\}$ , then,  $A - B = \{7, 9, 13, 14, 19\}$  and  $B - A = \{5, 8, 12, 15\}$ .



Important results on set operations:

1.  $n(A \cup B) = n(A) + n(B)$  if  $A$  and  $B$  are disjoint sets
2.  $n(A \cup B) = n(A) + n(B) - n(A \cap B)$
3.  $n(A \cup B \cup C) = n(A) + n(B) + n(C) - n(A \cap B) - n(B \cap C) - n(A \cap C) + n(A \cap B \cap C)$

**Example 1** If set  $P$  is the set of all the prime numbers less than 50, find the cardinal number of  $P$ .

**Solution:** Prime numbers less than 50 are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47.

The cardinal number of the set  $P$  is 15.

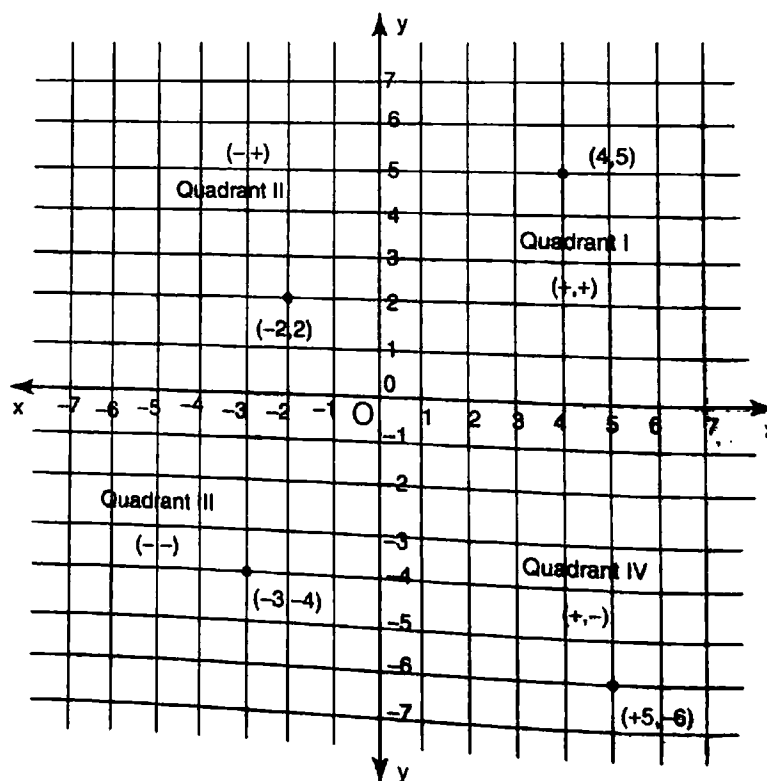


**Important Learning:** If the cardinal number of a set is  $n$ , the number of subsets is  $2^n$ . Out of this,  $(2^n - 1)$  subsets are proper subsets and the remaining one is an improper subset.

## 5 Coordinate Geometry

### Introduction

Coordinate geometry requires us to work with the rectangular coordinate system. In a plane, two perpendicular number lines are drawn, as shown in the figure below. The horizontal line is called the  $x$ -axis and the vertical one is called the  $y$ -axis. The point of intersection of the two axes is called the origin and is denoted by  $O$ .



The coordinate plane

Any point in the coordinate plane can be specified by the location of its  $x$  coordinate and  $y$  coordinate. Thus, if a point is specified as  $(2, 3)$ , this means that it lies at a distance of 2 units to the right of the  $y$ -axis and 3 units above the  $x$ -axis.

### Distance formula

The distance between any two points in the coordinate plane can be found using the distance formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

### Mid-point formula

The mid-point of a line connecting two points  $[(x_1, y_1) \text{ and } (x_2, y_2)]$  can be calculated using the formula

$$\text{Mid point} = \left[ \frac{(x_1 + x_2)}{2}, \frac{(y_1 + y_2)}{2} \right]$$

### Slope of a line

Slope is the inclination of a line with reference to the  $x$ -axis. It is denoted by  $m$  and is calculated as

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

1. If a line is slanting up from left to right, then its slope is positive.
2. If a line is slanting down from left to right, then its slope is negative.
3. If a line is parallel to  $x$ -axis, then its slope is zero.
4. If a line is parallel to  $y$ -axis, then its slope is undefined.
5. Two parallel lines have the same slope.
6. The slopes of two perpendicular lines are negative reciprocals of each other. So, if the slope of line A is 3, then the slope of line B, which is perpendicular to line A, will be  $-\frac{1}{3}$ .



**Important Learning:** Parallel lines have the same slope and the slopes of perpendicular lines are negative reciprocals.

**Important!**

### Intercepts

1. The  $x$ -intercept is the  $x$  coordinate of the point where a line intersects the  $x$ -axis.
2. The  $y$ -intercept is the  $y$  coordinate of the point where a line intersects the  $y$ -axis.

### Equation of a line

The equation of a line is simply the relation between its  $x$  and  $y$  coordinates for any given point on the line. All points on the line will satisfy this relation.

The equation of a line is written as

$$y = mx + c$$

where  $m$  is the slope and  $c$  is the  $y$ -intercept of the line.

Thus, to find the equation of a line, you have to know the value of its slope and its  $y$ -intercept.

## 2.14 Data Interpretation

## 2.15 What is Measured?

The Data Interpretation section consists of tables, charts, pie diagrams, etc., that you will need to analyse and apply while answering the questions.

Your mental math skills get tested indirectly as you will need to make a lot of quick calculations especially using concepts of percentages, ratios, etc.

Your estimation skills also get tested as, in a lot of the questions, you will be able to arrive at the answer just by intelligent estimation and elimination of wrong answer choices.

## 2.16 Overall Test Taking Strategies

- Scan the data once quickly but do not pay too much attention to every small detail as you can always do so later, based on the questions that you get.
- The figures are all drawn to scale so you can estimate the answer, especially if the answer choices are very far apart.
- Do not confuse percentages with actual numbers.

The next few pages will provide you with in-depth strategies for approaching this topic.

# 1 Data Interpretation

## Introduction

Data Interpretation is an important area in testing the aptitude of a candidate. The primary objective in Data Interpretation (henceforth referred to as DI) is to:

1. Assess the capability of data assimilation, that is, to understand a data in its given form.
2. Carry out calculations based on the given data.
3. Take effective business decisions based on the calculations.

The data could be in the form of a caselet, bar graph, line graph, pie chart, histogram, frequency polygon, etc.

## Concepts in data interpretation

### Growth and growth rate

Growth in essence is the change in the value of a variable from one point in time to another point in time. Although it is generally associated with an increase in the value of a variable, mathematically, the value of growth can be negative.

Since, growth and growth rate are associated also with the change in a variable with respect to time, both of them are usually calculated on the immediate previous value until and unless mentioned otherwise. While growth is the change in the absolute value of a variable, growth rate is the percentage change in the value of a variable. In order to understand the concept of growth and growth rate, let us look at an example:

**Example 1** The following table gives the value of the total sales of AR Associates across four years. The sales value is in Rs. ('000).

Year	2012	2013	2014	2015
Sale	150	200	240	300

- Find the growth in the sales of AR Associates in the year 2014.
- Find the growth rate of sales of AR Associates in the year 2015.
- Find the growth rate of sales of AR Associates in the period 2012–2015.
- Find the growth rate of sales of AR Associates in the year 2012.
- If the growth rate of sales of AR Associates in the year 2012 is 25%, find the value of the sales of AR Associates in the year 2011.

**Solution:**

- The growth in the sales of AR Associates in the year 2014

$$2,40,000 - 2,00,000 = \text{Rs. } 40,000$$

- Growth rate of sales in the year 2015

$$\frac{(3,00,000 - 2,40,000)}{2,40,000} \times 100 = \frac{6}{24} \times 100 = 25\%$$

- (C) Growth rate of sales in the period 2012–2015

$$\frac{(3,00,000 - 1,50,000)}{1,50,000} \times 100 = 100\%$$

- (D) If we want to find out the growth rate of sales in the year 2012, we need to find the value of sales in the immediately preceding year, that is, 2011.

Since this data is not provided, the answer to the question cannot be determined.

- (E) Let  $y$  be the sales of AR Associates in the year 2011. Therefore,

$$y \times \frac{125}{100} = 1,50,000$$

$$y \times \frac{5}{44} = 1,50,000$$

$$y = \text{Rs. } 1,20,000$$

### Percentage change in growth rate

Many of us do not differentiate between the calculation of percentage change in growth and growth rate. Actually, these are two different concepts.

Percentage change in growth rate gives the percentage change between two values that are expressed in percentage terms, that is, percentage change in growth rate gives the percentage change in two values that are growth rates.

To understand the concept better, consider Example 1 again.

**Example 2** Find the percentage change in the growth rate of AR associates in the year 2014.

**Solution:** In order to answer this question, we would need the value of the growth rate of sales of AR Associates in the year 2013 and the year 2014.

Growth rate of sales of AR Associates in the year 2013

$$\frac{(2,00,000 - 1,50,000)}{1,50,000} \times 100 = \frac{100}{3} = 33.33\%$$

Growth rate of sales of AR Associates in the year 2014

$$\frac{(2,40,000 - 2,00,000)}{2,00,000} \times 100 = \frac{100}{5} = 20\%$$

Therefore, percentage change in growth rate

$$\frac{(20 - 33.33)}{33.33} \times 100$$

$$= -13.33 \times 3$$

$$= -40\%$$

That is, a decrease of 40%.

### Percentage points

Percentage point is the difference between two values that are expressed in percentage terms. Consider the following example.

**Example 3** A girl got 55% marks in the fifth semester and 57.5% marks in the sixth semester. By how many percentage points are the marks in the sixth semester more than the marks obtained in the fifth semester?

**Solution:** Required value =  $57.5\% - 55\% = 2.5$  percentage points.

### Market share

Market share is the total percentage of the market serviced by a company, product or brand. Market share can be calculated either on volume basis (number of units sold) or value basis (revenue or sales or turnover). Also average product price is equal to the total market value divided by the total market volume. Consider the following example.

**Example 4** In a market there are three products being sold. The price along with the total sale in value is given for each of the three products.

Product	Price/Unit	Sale in Numbers	Sale in Rs.
P	Rs. 5	10,000	50,000
Q	Rs. 4	15,000	60,000
R	Rs. 4.5	20,000	90,000

- (A) Find the market share of product P on volume basis.
- (B) Find the market share of product Q on value basis.
- (C) Find the average market price.

**Solution:**

- (A) Total market volume = 45,000 units.

Total sale of product P = 10,000 units.

$$\text{Market share of P on volume basis} = \frac{10,000}{45,000} \times 100 = \frac{200}{9} = 22.22\%$$

- (B) Total market value = Rs. 50,000 + Rs. 60,000 + Rs. 90,000 = Rs. 2,00,000
- Sales of product Q = Rs. 60,000

$$\text{Market share of product Q on value basis} = \frac{60,000}{2,00,000} \times 100 = 30\%$$

- (C) Average market price is given by

$$\frac{\text{Total market value}}{\text{Total market volume}} = \frac{2,00,000}{45,000} = \frac{200}{45} = \frac{40}{9} = \text{Rs. } 4.44/\text{unit}$$

These concepts in Data Interpretation are illustrated through the following solved examples.

Data for Examples 5–7: The following table gives the sales of four companies in lakhs across four years from 2004 to 2007. Read the data carefully and answer the questions that follow.

Company	2004	2005	2006	2007
A	120	130	145	160
B	150	166	160	190
C	170	185	190	200
D	110	125	140	150

**Example 5**

By what percentage are the sales of company B in the year 2005 more than that of company A in the year 2004?

- (A) 46%
- (B) 38.33%
- (C) 20%
- (D) 33.33%
- (E) 40%

**Solution:**

Required value

$$\left[ \frac{166 - 120}{120} \right] \times 100 = 46 \times \frac{5}{6} = \frac{230}{6} = 38.33\%$$

**Example 6**

By how much value is the average sale of company C more than the average sale of company D during the period?

- (A) 55 lakhs
- (B) 45 lakhs
- (C) 38 lakhs
- (D) 35 lakhs
- (E) None of these

**Solution:**

Average sales of company C is

$$170 + 185 + 190 + 200 = \frac{745}{4}$$

$$\text{Average sales of company D is } 110 + 125 + 140 + 150 = \frac{525}{4}$$

$$\text{Difference is } \frac{745}{4} - \frac{525}{4} = \frac{220}{4} = 55 \text{ lakh}$$

**Example 7**

If the four companies account for a 40% market share by value in 2007, what was the total sale of the market?

- (A) 16 crore



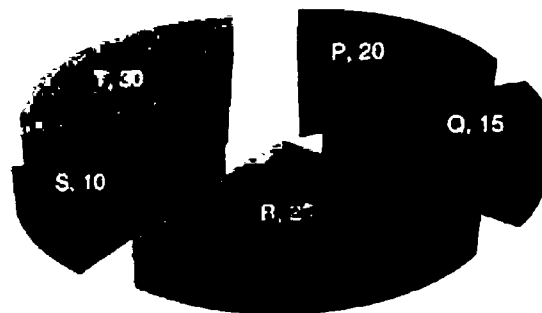
- (B) 20 crore
- (C) 14 crore
- (D) 17.5 crore
- (E) 18 crore

**Solution:** Total sales of the four companies in 2007 =  $160 + 190 + 200 + 150 = \text{Rs. } 700 \text{ lakh}$ .

This is 40% of the total sales. Therefore,

Total sales =  $700 \times 2.5 \text{ lakh} = \text{Rs. } 17.5 \text{ crores}$ .

**Data for Examples 8–10:** The given pie chart shows the percentage market share by volume of five companies P, Q, R, S and T in the television market in the year 2011. The total sale volume-wise in the market in the year 2011 is 4,00,000 TV sets.



**Example 8** If S is the others category and company X has a share of 30% in this category, find the number of TV sets sold by company X in the year 2011.

- (A) 10,000
- (B) 20,000
- (C) 12,000
- (D) 15,000
- (E) 18,000

**Solution:** Total sale of the others category = 10% of 4,00,000 = 40,000  
Sales of company X = 30% of 40,000 = 12,000.

**Example 9** If the total sale of two products P2 and P3 of company P is 30000, find the percentage contribution of products P2 and P3 to the total sales unit-wise of company P in the year 2011.

- (A) 50%
- (B) 40%
- (C) 60%
- (D) 75%
- (D) 37.5%

**Solution:** P2 and P3 have together sold 30000 units.

Company P has a total sale of 20% of 4,00,000 = 80,000

Therefore, contribution of P2 and P3

$$\frac{30,000}{80,000} \times 100 = 3 \times \frac{100}{8} = 3 \times 12.5 = 37.5\%$$

**Example 10** By what percentage is the market share of R more than the market share of P?

**Solution:** The percentage by which the market share of R is more than that of P is

$$\left( \frac{25 - 20}{20} \right) \times 100 = 25\%$$

**Data for Examples 11–13:** Two thousand students applied for admission to various programs at AU University. Out of the total applicants, 20% did not take the admission test. The following table gives the cumulative frequency in percentage of the mark range received by those students who appeared for the admission test.

Marks	Cumulative Frequency (%)
≤ 10 marks	15
≤ 20 marks	25
≤ 30 marks	40
≤ 40 marks	60
≤ 50 marks	85
≤ 60 marks	100

**Example 11** What is the number of students who received marks in the range of 21–30 in the admission test?

- (A) 640
- (B) 240
- (C) 400
- (D) 500
- (E) None of these

**Solution:** As per the problem, 2,000 students applied out of which 20% did not appear for the test.

Number of students who appeared = 80% of 2,000 = 1,600

Percentage of students in the range of 21–30 marks = 40 – 25 = 15%

Therefore, 15% of 1,600 = 240 students

**Example 12** If more than 40 marks are required to qualify for the next round, find the difference between the number of students who qualified for the next round and those who failed to qualify for the next round.

- (A) 160

- (B) 240
- (C) 420
- (D) 320
- (E) 380

**Solution:** Percentage of students who qualified for the next round = 40%  
 Percentage of students who did not qualify for the next round = 60%  
 Difference between the two = 20% of 1600 = 320 students

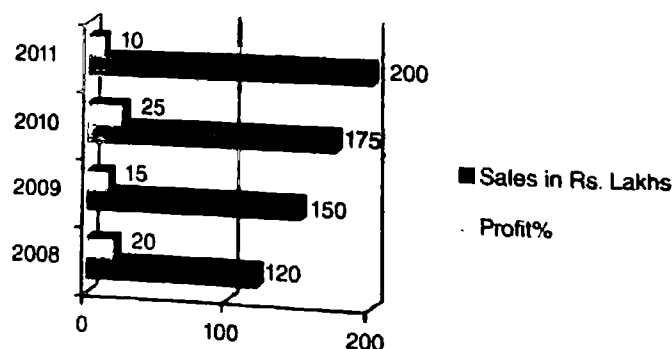
**Example 13** By what percentage is the number of students in the range of 41–50 marks more than those in the range of 0–10 marks?

- (A) 66.66%
- (B) 33.33%
- (C) 10%
- (D) 20%
- (E) 55.55%

**Solution:** Percentage of students in the range of 41–50 marks = 25%  
 Percentage of students in the range of 0–10 marks = 15%  
 Therefore,

$$\left( \frac{25 - 15}{15} \right) \times 100 = 66.66\%$$

**Data for Examples 14–16:** The given bar graph shows the total sales value (in Rs. lakh) and the profit percentage for a company ABC Ltd. for 4 years from 2008 to 2011. Answer the questions based on the following data.



**Example 14** If the total sales is equivalent to the selling price, what is the value of profit for ABC Ltd. for the year 2010?

- (A) Rs. 35 lakh
- (B) Rs. 38.75 lakh
- (C) Rs. 40 lakh
- (D) Rs. 45 lakh

(E) None of these

**Solution:** We need to find out the profit for the year 2010. Therefore,

$$CP \times \frac{125}{100} = 175 \Rightarrow CP \times \frac{5}{4} = 175 \Rightarrow CP = 4 \times 35 = 140$$

$$\text{Profit} = 175 - 140 = \text{Rs. } 35 \text{ lakh}$$

**Example 15** Which year has shown the highest percentage change in profit %?

- (A) 2008
- (B) 2009
- (C) 2010
- (D) 2011
- (E) Cannot be determined

**Solution:** Percentage change in profits for 2008 cannot be calculated since we do not know the profits for 2007.

$$\text{Percentage change in profits for 2009} = \frac{(20 - 15)}{20} \times 100 = 25\%$$

$$\text{Percentage change in profits for 2010} = \frac{(25 - 15)}{15} \times 100 = 66\% \text{ approx}$$

$$\text{Percentage change in profits for 2011} = \frac{(25 - 10)}{25} \times 100 = 60\%$$

Thus the maximum change has been for the year 2010.

The correct answer is (C).


**Example 16** By what percentage is the sales in 2011 more or less than the cost in 2008?

- (A) 50%
- (B) 100%
- (C) 200%
- (D) 250%
- (E) 300%

**Solution:** Cost in 2008 = Rs. 100 lakhs

Sales in 2011 = Rs. 200 lakhs

$$\text{Percentage change} = \left( \frac{200 - 100}{100} \right) \times 100 = 100\%$$

 **Important Learning:** The knowledge of fractional equivalents of various percentages, such as 12.5% is the same as  $\frac{1}{8}$ , will be very important while attempting data interpretation questions.

## 2.17. Data Sufficiency

## 2.18 What is Measured?

Data sufficiency questions measure your ability to analyse data and decide whether it is enough to answer the given question. The actual answer to the question is irrelevant for our purpose.

A lot of the data sufficiency questions will test you on arithmetic concepts such as prime numbers, odd and even numbers, negative exponents and fractions, etc.

## 2.19 Overall Test Taking Strategies

- Do not try to solve every statement. You only need to determine whether the given statement is sufficient to answer the given question.
- Consider each statement separately, especially when you are looking at the second statement.
- Read the question carefully. If the question asks you whether you can find the value of  $y$  and you realise that you cannot do so, you still have a definite answer, that is, no.
- Remember the answer choices—(A), (B), (C), (D), (E)—and what each of them stands for.

The next few pages will provide you with in-depth strategies for approaching the topic.

# 1 Data Sufficiency

## Introduction

The primary objective of data sufficiency questions is to find out whether the given data is sufficient to answer the question asked. In order to understand data sufficiency, we will need to look at the following aspects:

1. The structure of a data sufficiency problem.
2. The answer choices of a data sufficiency problem.
3. How to approach a data sufficiency problem.
4. The common errors in a data sufficiency problem.

## Structure of a data sufficiency problem

In a data sufficiency problem, a question is asked which needs to be answered based on the given data. The given data is usually in the form of two statements called I and II. The question asked needs to be answered based on the two given statements. For example:

Question: What is the speed of the train?

- I. The train covers 50 km in 30 minutes.
- II. The length of the train is 200 m.

## Answer choices

The answer choices given in a data sufficiency problem are as follows:

- (A) Statement (1) ALONE is sufficient, but Statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but Statement (1) ALONE is not sufficient.
- (C) BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient, and additional data is needed.

Note: Although the options will be the same in most of the cases, it is not necessary that they will always be the same. It is suggested that a student should always read the instructions about the options while answering the question.

## Approach to a data sufficiency problem

The following steps are to be followed while solving a data sufficiency problem:

1. Check whether the question can be answered using statement I alone without using the data given in statement II.
2. Check whether the question can be answered using statement II alone without using the data given in statement I.
3. If neither of the two given statements can answer the question alone, combine the data given in the two statements to answer the question asked. In this case, the answer option of the question will be option (C).
4. If the question asked cannot be answered by using the given data, the answer option will be option (E).

## Common errors in data sufficiency problems

Some commonly made errors are listed as follows:

1. While checking whether the question asked can be answered by using any one of the two statements alone, you pick up data from another statement by mistake.
2. You need to combine the two statements only when you are sure that either of the two statements cannot answer the question alone.
3. If you get more than one answer, it is not acceptable in a data sufficiency problem. For example, if  $x^2 = 49$ , then  $x$  will have two values of  $+7$  and  $-7$ . In a situation like this, we would say that the question cannot be answered.
4. Even a definite 'No' is an answer to a data sufficiency problem. For example, if the question asked is: 'Is 1 an example of a prime number?', then it has a definite answer which is 'No'.

These common errors in approach to data sufficiency problems are illustrated through the following examples.

**Example 1** What is the value of  $x$ ?

I.  $x^2 - 5x + 6 = 0$

**Solution:** If we solve for  $x$ , the quadratic equation will give the values as  $x = 2$  or  $x = 3$ .

So the given problem has more than one answer. This is not acceptable in data sufficiency. We always need a unique solution. It is here that data sufficiency is different from quantitative skills.

**Example 2** Can I fill up the tank of 100 L capacity completely? (Measurements are accurate and there should be no overflow.)

I. I have a bucket which can exactly measure 5 L.

II. I have a mug which can exactly measure 3 L.

- (A) Statement (I) ALONE is sufficient, but Statement (II) ALONE is not sufficient.
- (B) Statement (II) ALONE is sufficient, but Statement (I) ALONE is not sufficient.
- (C) BOTH statements (I) and (II) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (I) and (II) TOGETHER are NOT sufficient, and additional data is needed.

**Solution:** Many students make the mistake of thinking that only statement I alone can answer the question asked because the important aspect for them is that the tank should be filled whereas the important aspect is whether we can answer the question uniquely about the tank getting filled.

Therefore, in the above example, using statement I alone, the answer is yes, the tank can be filled completely and so statement I alone is able to answer the question asked.

Similarly, using statement II alone, the answer is a definite no, the tank cannot be filled completely and so statement II alone is also able to answer the question asked.

So, as per the standard answer options of data sufficiency, the correct answer to the question is option (D).



Let us now look at some more illustrative examples to understand the options better.

**Example 3** What is the value of  $x$ ?

- I.  $x^3 = -27$
- II.  $x^2 = 9$

- (A) Statement (I) ALONE is sufficient, but Statement (II) ALONE is not sufficient.
- (B) Statement (II) ALONE is sufficient, but Statement (I) ALONE is not sufficient.
- (C) BOTH statements (I) and (II) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (I) and (II) TOGETHER are NOT sufficient, and additional data is needed.

**Solution:** If we use the first statement alone, we will get a unique value of  $x = -3$ . Therefore, the question can be answered by using statement I alone.

If we use statement II alone, we will get two values of  $x$  as 3 and  $-3$ . As data sufficiency requires a unique answer, the question cannot be answered by using statement II alone.

Hence, the correct answer is option (A).



**Important Learning:** Even though one of the two answers to the question using statement II is  $-3$  which is obtained from statement I also, the question cannot be answered by using statement II alone.

**Example 4** On which day was Naveen born?

- I. On 25th November, Naveen celebrated his ninth birthday.
- II. Naveen was born on a Friday.

- (A) Statement (I) ALONE is sufficient, but Statement (II) ALONE is not sufficient.
- (B) Statement (II) ALONE is sufficient, but Statement (I) ALONE is not sufficient.
- (C) BOTH statements (I) and (II) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (I) and (II) TOGETHER are NOT sufficient, and additional data is needed.

**Solution:** The question is asking about the day when Naveen was born and not the date. From statement I we get the date but not the day.

Using statement II alone, we can conclude that Naveen was born on a Friday.

The question can be answered by using statement II alone but not by using statement I alone.

Hence, the correct answer is option (B).

**Example 5** What is the speed of the train?

- I. In an hour, the train covers a distance of 50 km after stopping for 15 min.
- II. The train is 150-m long and crosses a man moving in the same direction at 5 km/hr in 10 s.

- (A) Statement (I) ALONE is sufficient, but Statement (II) ALONE is not sufficient.
- (B) Statement (II) ALONE is sufficient, but Statement (I) ALONE is not sufficient.
- (C) BOTH statements (I) and (II) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (I) and (II) TOGETHER are NOT sufficient, and additional data is needed.

**Solution:** We can find the speed of the train using statement I alone. Do remember, the question does not want us to find the value of the speed of the train.

What is required to be known is that distance covered and time taken can be used to find out the speed of a moving body.

Similarly, using statement II alone, the question can be answered.

Hence, the correct answer is option (D).

**Example 6** What is the profit earned in rupees?

- I. The marked price is Rs. 400 and it is sold at a discount of 30%.
- II. The marked price is 50% more than the cost price.

- (A) Statement (I) ALONE is sufficient, but Statement (II) ALONE is not sufficient.
- (B) Statement (II) ALONE is sufficient, but Statement (I) ALONE is not sufficient.
- (C) BOTH statements (I) and (II) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (I) and (II) TOGETHER are NOT sufficient, and additional data is needed.

**Solution:** In order to answer the question, we will require the values of the cost price and the selling price.

While statement I can give us the selling price, we do not know the cost price.

Also, statement II can give us the cost price but we do not know the selling price.

Therefore, either of the two statements is not sufficient to answer the question alone.

Both the statements together can answer the question asked.

Hence, the correct answer is option (C).

**Example 7** What is the ratio of the prices of A and B?

- I. Three years ago, their prices were in the ratio 4:5.
- II. In the last 3 years, the price of both A and B has increased by Rs. 5000.

- (A) Statement (I) ALONE is sufficient, but Statement (II) ALONE is not sufficient.
- (B) Statement (II) ALONE is sufficient, but Statement (I) ALONE is not sufficient.
- (C) BOTH statements (I) and (II) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.

- (E) Statements (I) and (II) TOGETHER are NOT sufficient, and additional data is needed.

**Solution:** When we look at a question like this, many of us would be tempted to mark option (C) as the answer.

The question cannot be answered by using either of the two statements alone, and therefore, we will try to answer the question by combining the two statements.

Let their prices be  $4x$  and  $5x$ , respectively.

Also, their prices have increased by Rs. 5000 each.

The ratio of their prices will be  $(4x + 5000):(5x + 5000)$ , which will not give any definite value of their prices.

Hence, the correct answer is option (E).

**Example 8** In how much time will the work be completed if 15 men work for 8 h every day?

- I. 20 women working for 7 h can do the work in 12 days.
- II. 8 men working for 15 h can do the work in 18 days.

- (A) Statement (I) ALONE is sufficient, but Statement (II) ALONE is not sufficient.
- (B) Statement (II) ALONE is sufficient, but Statement (I) ALONE is not sufficient.
- (C) BOTH statements (I) and (II) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (I) and (II) TOGETHER are NOT sufficient, and additional data is needed.

**Solution:** The question cannot be answered by using statement I alone because we do not know the efficiency comparison of a man and a woman.

Using statement II alone and equating the total work to be done in the section Time and Work, we have

$$8 \times 15 \times 18 = 15 \times 8 \times y$$

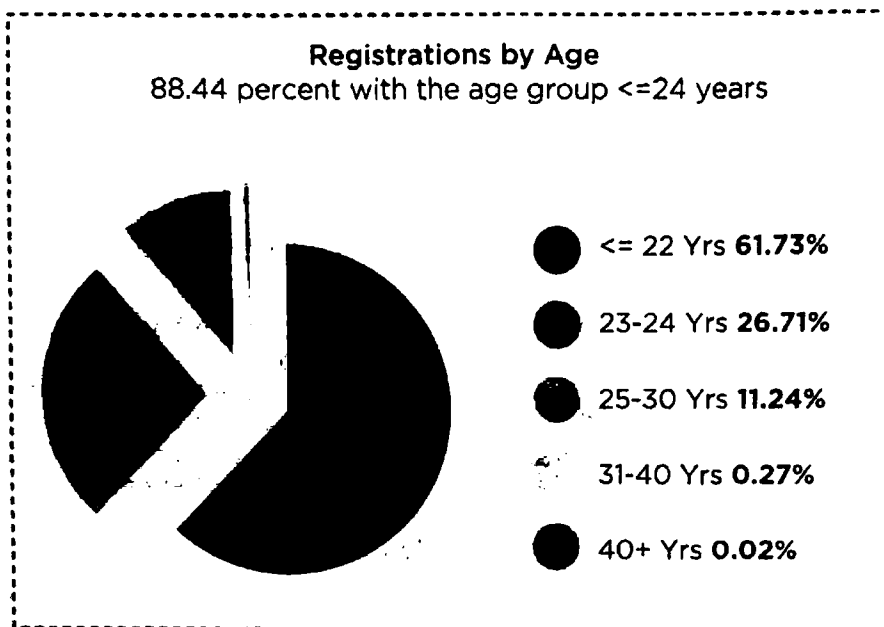
Solving, we get  $y = 18$  days

Hence, the correct answer is option (B).

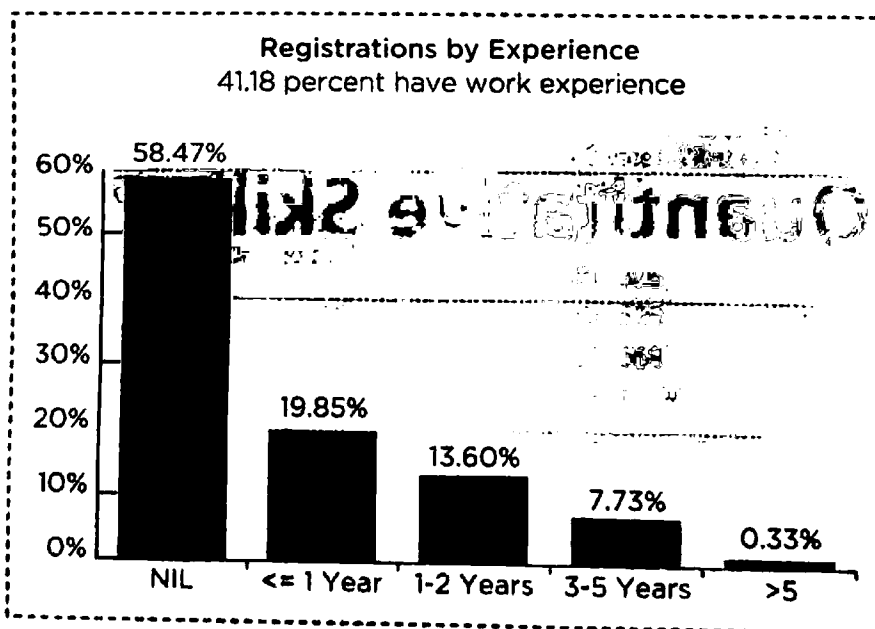


**Important Learning:** Do not make the mistake of picking up information from Statement I while checking Statement II and vice versa.

## NMAT by GMAC™ Test Taker Data (2016)



NMAT by GMAC™ 2016 remained the preferred choice of the iGeneration as 88.44% of the registrants were 24 years old or younger



NMAT by GMAC™ 2016 continued to have a healthy mix of registrants both with and without industry experience with 41.18% representation of the former

## 3.0 Quantitative Skills Practice

## 3.1 Practice Questions

Solve the problems and indicate the best of the answer choices given.

**Numbers:** All numbers used are real numbers.

**Figures:** A figure accompanying a problem-solving question is intended to provide useful information for solving the problem. Figures are drawn as accurately as possible. Exceptions will be clearly noted. Lines shown as straight are straight, and lines that appear jagged are also straight. The positions of points, angles, regions, etc., exist in the order shown, and angle measures are greater than zero. All figures lie in a plane unless otherwise indicated.

- Manoj plans to work at a coffee shop during his summer holidays. He will be paid as per the following schedule: at the end of the first week, he will receive Rs. 1000. At the end of each subsequent week, he will receive Rs. 1000, plus an additional amount equal to the sum of all payments he has received in the previous weeks. How much money will Manoj be paid in total if he works for 6 weeks at this coffee shop?
  - Rs 18000
  - Rs. 20000
  - Rs. 42000
  - Rs. 63000
  - Rs. 81000
- If the number  $2546bc$  is completely divisible by 3, find the possible values of  $b + c$ .
  - 2
  - 3
  - 5
  - 13
  - 17
- A number  $Q$  gives a remainder of 5 when divided by 7. Find the remainder when  $2Q$  is divided by 7.
  - 2
  - 3
  - 5
  - 7
  - 9
- In an ancient civilisation, the measure of a foot was the size of the head of the current ruler of the civilisation. If the ruler at that time had a head that was 10-inches long, a fence that measured 600 feet at that time would today have a length of how many feet? (Today, 12 inches = 1 foot)
  - 300
  - 450
  - 500
  - 750
  - 800
- Almonds at Rs. 3 per pound are mixed with peanuts at Rs. 5 per pound. If the total weight of the mixture is 10 lbs and the average cost is Rs. 4.8 per pound, how many pounds of peanuts are there in the mixture?  
(Real NMAT Question)
  - 5
  - 6
  - 7
  - 8
  - 9
- In an election between two candidates, a candidate got 55% of the votes polled and won by a margin of 80 votes. In the next election, the number of votes received by the candidate increased by 20%. Still, the candidate lost the election by a margin of 40 votes. What is the increase in the number of votes polled?
  - 296
  - 306
  - 528
  - 568
  - 1,096
- Manish has 60 marbles that he wants to divide among himself and his 12 friends. The marbles don't necessarily have to be divided equally. If Manish wants to have more marbles than any of his friends, what is the least number of marbles he can have?
  - 5
  - 6
  - 7
  - 8
  - 12

8. If  $3x^3 - 7 = 185$ , what is  $x^2 - x$ ?
- (A) -4  
(B) 8  
(C) 12  
(D) 16  
(E) 27
9. If the product of the first hundred multiples of 5 yields a particular number, then what exact power of 125 will make the number exactly divisible?  
(Real NMAT Question)
- (A) 34  
(B) 40  
(C) 48  
(D) 68  
(E) 80
10. If  $a^2 - b^2 = 0$  and  $ab \neq 0$ , which of the following must be true? Indicate all such statements.
1.  $a = b$
  2.  $|a| = |b|$
  3.  $\frac{a^2}{b^2} = 1$
- (A) 1 only  
(B) 2 only  
(C) 3 only  
(D) 1 and 2 only  
(E) 2 and 3 only
11. If  $(x - y) = \sqrt{20}$  and  $(x + y) = \sqrt{12}$  what is the value of  $x^2 - y^2$ ?
- (A)  $2\sqrt{15}$   
(B)  $4\sqrt{15}$   
(C)  $3\sqrt{20}$   
(D)  $6\sqrt{12}$   
(E)  $2\sqrt{21}$
12. Ram opened a savings account with a bank on 1st February 2010 with a certain amount. Interest is calculated every month on simple interest basis and credited to his account at the end of June and December every year, and the rate of interest is 5% per annum. If the sum of the minimum balance is Rs. 2,000 at the end of June 2010, then what is the interest that he gets at the end of June 2010?  
(Real NMAT Question)
- (A) Rs. 8.01  
(B) Rs. 8.20  
(C) Rs. 8.33

- (D) Rs. 8.40  
(E) None of the above
13. The average price of three items is Rs. 7,000. The price of the costliest item is Rs. 900 more than the combined price of the other two. Find the price of the costliest item as a percentage of the total cost of the three items.
- (A) 46%  
(B) 48%  
(C) 50%  
(D) 52%  
(E) 54%
14. What is the smallest integer which is greater than 100 and which leaves a remainder of 2 when divided by any of the integers 3, 5 and 7?
- (A) 18  
(B) 38  
(C) 105  
(D) 107  
(E) 213
15. The sum of the ages of the five members in a family is 124 years. If the age of the children is in the ratio 3:4:5 while the combined age of their parents is 48, find the age of the youngest child.
- (A) 8  
(B) 12  
(C) 13  
(D) 14  
(E) 15
16. A question is followed by two statements, numbered (1) and (2). Using the information provided and your general knowledge, decide whether the information given is sufficient to solve the problem.  
(Real NMAT Question)
- Is  $z = 2$  and  $x = 9$ ?
- (1)  $y\sqrt{x} = -3$   
(2)  $y^2z = 2$
- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

17. If  $x$  is an odd number, which of the following must be even?

(A)  $x^2$   
 (B)  $x^2 + 2$   
 (C)  $\frac{(x+1)}{2}$   
 (D)  $2x + 1$   
 (E)  $2x + 2$

18. In which of the following cases can the area of a rhombus be uniquely identified?

(Real NMAT Question)

Case (I) Side = 4 cm

Case (II) Side = 4 units; one diagonal = 3 units

Case (III) Two diagonals are of lengths 5 units and 7 units

(A) Cases (I) and (II)  
 (B) Cases (II) and (III)  
 (C) Cases (I) and (III)  
 (D) Cases (I), (II) and (III)  
 (E) None of the cases

19. If  $ab \neq 0$ ,  $\frac{a^8 - b^8}{(a^4 + b^4)(a^2 + b^2)} =$

(A) 1  
 (B)  $a - b$   
 (C)  $(a + b)(a - b)$   
 (D)  $(a^2 + b^2)(a^2 - b^2)$   
 (E)  $\frac{a - b}{a + b} 2\sqrt{2}$

20. The sum of a two-digit number and the number obtained by reversing the digits is a multiple of 88. If the difference of the digits at the ten's place and unit's place is 6, find the digit at the ten's place of the number.

(A) 1  
 (B) 3  
 (C) 5  
 (D) 6  
 (E) 7

21. In a business, Gita and Sita invested in the ratio of 4:5. The ratio of their income is 1:2 if Sita's salary is also included. At the end of the year, they earned a profit of Rs. 72,000. Find Sita's salary.

(Real NMAT Question)

(A) Rs. 15,000  
 (B) Rs. 16,000  
 (C) Rs. 17,000

(D) Rs. 18,000  
 (E) Rs. 19,000

22. Two trains start from A and B and move towards B and A, respectively. The train from A starts at 6 a.m. and reaches B at 2 p.m., whereas the train from B starts at 8 a.m. and reaches A at 2 p.m. In how much time after 8 a.m. will the two trains meet?

(A)  $1\frac{8}{9}$  h  
 (B)  $\frac{15}{7}$  h  
 (C)  $2\frac{1}{6}$  h  
 (D)  $2\frac{4}{7}$  h  
 (E)  $3\frac{1}{6}$  h

23. Which of the following is equal to  $(a - 2)^2 + (a - 1)^2 + a^2 + (a + 1)^2 + (a + 2)^2$ ?

(A)  $5a^2$   
 (B)  $5a^2 + 10$   
 (C)  $a^2 + 10$   
 (D)  $5a^2 + 6a + 10$   
 (E)  $5a^2 - 6a + 10$

24. How much tea selling at Rs. 10.40 per kg should be mixed with tea selling at Rs. 8.80 per kg to get a resulting mixture of 15 kg for Rs. 146.40?

(Real NMAT Question)

(A) 6 kg  
 (B) 7 kg  
 (C) 8 kg  
 (D) 9 kg  
 (E) 10 kg

25. Pipe 1 can normally fill a tank alone in 40 days but takes 20 days more due to a leak. In how much time can the leak alone empty half the tank?

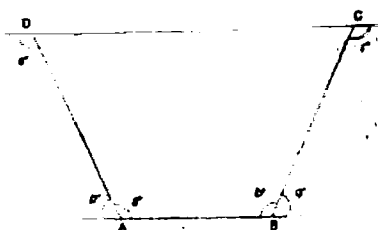
(A) 25  
 (B) 35  
 (C) 55  
 (D) 60  
 (E) 70



26.  $a$  is inversely proportional to  $b$ . Also, it is given that  $a = 24$  when  $b = 2$ . What is the value of  $b$  when  $a = 6$ ?

(A) -2  
(B) -1  
(C) 2  
(D) 4  
(E) 8

27. In the given quadrilateral ABCD,  $p^\circ + q^\circ = 100^\circ$ ,  $a^\circ = 140^\circ$  and  $r^\circ = \frac{1}{2}(a^\circ + q^\circ)$ . Find the value of angle  $s^\circ$ . (Real NMAT Question)



(A)  $120^\circ$   
(B)  $130^\circ$   
(C)  $140^\circ$   
(D)  $150^\circ$   
(E)  $160^\circ$

28. The time it takes to construct a hut is inversely proportional to the number of workers doing the work. If it takes 40 workers giving 3 hours each to do the job, how long will it take for 140 workers to do the job, to the nearest minute?

(A) 51 minutes  
(B) 52 minutes  
(C) 53 minutes  
(D) 54 minutes  
(E) 55 minutes

29. If  $2(x - 1)^3 + 3 \leq 19$ , then the value of  $x$  must be:

(A) greater than or equal to 3  
(B) less than or equal to 3  
(C) greater than or equal to -3  
(D) less than or equal to -3  
(E) less than -3 or greater than 3

30. A man pays a rent of Rs. 50 for the first day, Rs. 100 for the second day and so on, with the rent on each day being Rs. 50 more than the rent on the previous day. What is the total rent paid for the first 10 days?

(A) 2,750  
(B) 2,800  
(C) 3,050  
(D) 3,100  
(E) 3,350

31. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem. (Real NMAT Question)

Three-fourths of the boys in a class are intelligent and there are 18 intelligent boys in the class. What is the number of girls in the class?

- (1) Boys comprise two-thirds of the total number of students in the class; the rest are girls.  
(2) The number of girls is less than the number of boys.

(A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

32. Five years ago, the average age of a husband and wife was 35 years. Today, the average age of the husband, wife and a child is 28 years. What was the average age of the couple when the child was born?

(A) 35  
(B) 36  
(C) 38  
(D) 40  
(E) 42

33. In a race of 875 m, A can beat B by 175 m. In another race of 6,300 m, B can beat C by 1,575 m. By what distance can A beat C in a race of 2,187.5 m? (Real NMAT Question)

(A) 175 m  
(B) 525 m  
(C) 875 m  
(D) 1,225 m  
(E) 1,575 m

34. A motorcycle tyre has spokes that go from a central point in the hub to equally spaced points on the rim.

of the wheel. If there are fewer than six spokes, what is the smallest possible angle between any two spokes?

- (A)  $18^\circ$
- (B)  $30^\circ$
- (C)  $40^\circ$
- (D)  $60^\circ$
- (E)  $72^\circ$

35. If  $|3a + 7| \geq 2a + 12$ , then

- (A)  $a \leq -\frac{19}{5}$
- (B)  $a \geq -\frac{19}{5}$
- (C)  $a \geq 5$
- (D)  $a \leq -\frac{19}{5}$  or  $a \geq 5$
- (E)  $-\frac{19}{5} \leq a \leq 5$

36. A circle is drawn inside an isosceles triangle XYZ ( $ZX = ZY$ ) with O as centre. Another circle is drawn taking Z as the centre such that it touches the side XY at the same point as the smaller circle. The side XZ when extended meets the bigger circle at point A such that  $XA = 18$  cm. If the radius of the bigger circle is 8 cm, find the area of the smaller circle. (Real NMAT Question)

- (A)  $9\pi$
- (B)  $11\pi$
- (C)  $12\pi$
- (D)  $15\pi$
- (E)  $18\pi$

37. A bag contains five red and nine black balls, while another has three red and five black balls. A ball is first selected at random from bag 1 and transferred to bag 2, and then a ball is drawn from bag 2. What is the probability that the ball drawn is red?

- (A)  $\frac{25}{103}$
- (B)  $\frac{47}{126}$
- (C)  $\frac{33}{97}$
- (D)  $\frac{47}{97}$
- (E)  $\frac{61}{131}$

38. In a class having 60% girls, 40% of the students qualified in a test. If 50% of the girls qualified, find the number of boys who did not qualify in the test as a percentage of the total strength of the class?

- (A) 10%
- (B) 30%
- (C) 45%
- (D) 55%
- (E) 90%

39. The side of a square was decreased by  $y\%$  and, hence, the area decreased by 11.64%. Find the value of  $y$ .

- (A) 4%
- (B) 5.5%
- (C) 6%
- (D) 6.5%
- (E) 7%

40. If  $x$  is an integer and  $\sqrt{192} < x\sqrt{12}$  and  $\frac{x}{\sqrt{12}} < \sqrt{12}$ , which of the following can be the value of  $x$ ?

- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 12

41. Find the smallest number which when divided by 8, 12, 15, 20 leaves remainders of 4, 8, 11 and 16 respectively and it leaves a remainder of 10 when divided by 11. (Real NMAT Question)

- (A) 356
- (B) 596
- (C) 956
- (D) 1,196
- (E) 1,436

42. If  $\left|\frac{a}{b}\right|$  and  $\left|\frac{x}{y}\right|$  are reciprocals, and  $\left(\frac{a}{b}\right)\left(\frac{x}{y}\right) < 0$ , which of the following must be true?

- (A)  $ab < 0$
- (B)  $\frac{a}{b}\left(\frac{x}{y}\right) < -1$
- (C)  $\frac{a}{b} < 1$

- (D)  $\frac{a}{b} = -\frac{y}{x}$
- (E)  $\frac{y}{x} > \frac{a}{b}$
43. If  $a^x = b^y = c^z$  and  $b^2 = ac$ , find the value of  $y$  in terms of  $x$  and  $z$ .
- (A)  $\frac{xz}{z} + x$
- (B)  $\frac{x}{z} + x$
- (C)  $\frac{2xz}{x+z}$
- (D)  $\frac{x+z}{z}$
- (E) None of these
44. If the collection of a movie is Rs. 100,000 for the first day, Rs. 120,000 for the second day, Rs. 140,000 for the third day and so on, that is, the collection increases by Rs. 20,000 every day, then find the total collection for the first 10 days.
- (A) Rs. 1200,000
- (B) Rs. 1400,000
- (C) Rs. 1600,000
- (D) Rs. 1700,000
- (E) Rs. 1900,000
45. Three cards are drawn from a pack of cards at random. Find the probability that they consist of both colours.
- (A)  $\frac{{}^{26}C_1 \times {}^{26}C_2}{{}^{52}C_3}$
- (B)  $\frac{2 \times {}^{26}C_1 \times {}^{26}C_2}{{}^{52}C_3}$
- (C)  $\frac{{}^{26}C_3}{{}^{52}C_3}$
- (D)  $\frac{2 \times {}^{26}C_1 \times {}^{26}C_2}{{}^{52}C_3}$  and  $\frac{{}^{26}C_3}{{}^{52}C_3}$
- (E) None of these
46. Ashim is creating a mathematical quiz for his students. He is thinking of a geometric progression in which the third term is 16 and the sixth term is twice the square of the second term. What is the eleventh term in this geometric progression?
- (Real NMAT Question)
- (A) 1,024
- (B) 2,048

- (C) 4,096
- (D) 6,144
- (E) 8,192

47. The interest rate, compounded annually, that would bring a principal of Rs. 1,200 to a final value of Rs. 1,650 in 2 years is approximately:
- (A) 17%
- (B) 18%
- (C) 19%
- (D) 20%
- (E) 21%
48. A started a business with a capital of Rs. 5,000. Three months later, B joined with a capital of Rs. 7,000. After another 3 months, A invested Rs. 1,000 more while B withdrew Rs. 2,000. Two months later, C joined with a capital of Rs. 5,000. What ratio should the profits be divided at the end of the year?
- (A) 22:4:17
- (B) 22:17:8
- (C) 22:17:4
- (D) 66:51:20
- (E) 66:17:20

Directions for Questions 49–52: Go through the graphs and solve the questions based on them.  
(Real NMAT Question)

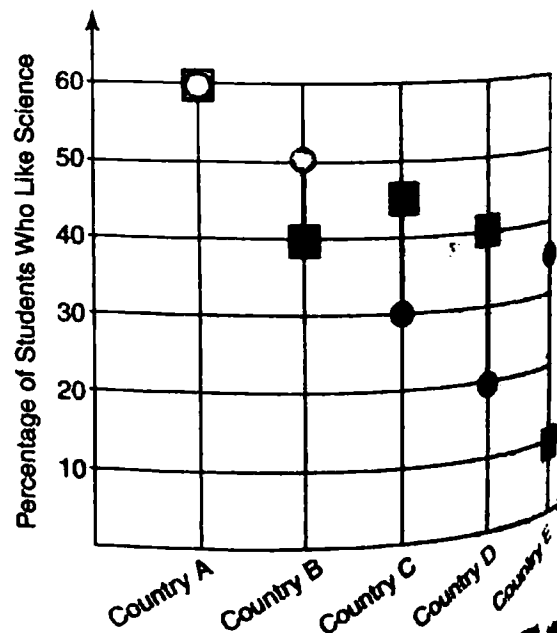


Figure 1

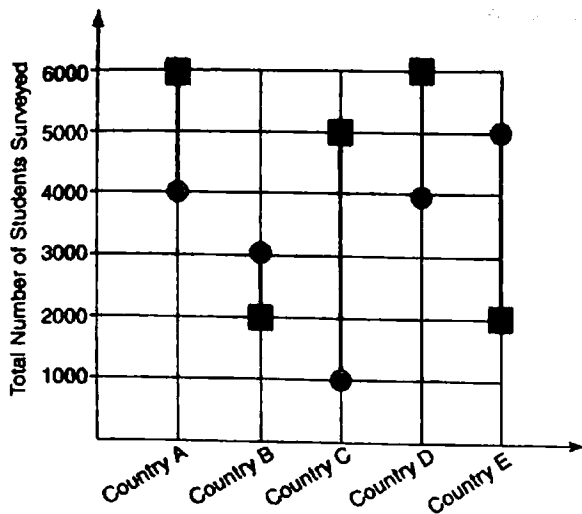


Figure 2

49. In 2010, the total number of students surveyed in the five countries who liked science was 8,450. Which statement is true about the total number of students surveyed in the five countries who liked science?
- (A) It remained the same between 1998 and 2008 but changed between 2008 and 2010.  
 (B) It increased by 13.05% between 1998 and 2008 but decreased by 15.03% between 2008 and 2010.  
 (C) It decreased by 13.05% between 1998 and 2008 but increased by 15.03% between 2008 and 2010.  
 (D) It increased by 27.03% between 1998 and 2008 but decreased by 25.19% between 2008 and 2010.  
 (E) It decreased by 27.03% between 1998 and 2008 but increased by 25.19% between 2008 and 2010.
50. In the year 2000, the total number of students surveyed in the five countries who liked science was 10% more than the total number of students surveyed in the five countries in 1998 who did not like science. Out of the total number of students surveyed in the five countries who liked science in the year 2000, there were 2,000 students who liked only physics but not chemistry and biology, 4,346 students who liked only chemistry but not physics and biology and 5,579 students who liked biology. How many students surveyed in the five countries who liked science in the year 2000 did not like biology but liked both physics and chemistry?
- (A) 925  
 (B) 1,000  
 (C) 1,320  
 (D) 2,425  
 (E) 2,835
51. In 2010, this survey was conducted in Country F. The number of students of Country F who participated in the survey was equal to the difference between the number of students surveyed in countries A, B, C, D and E who liked science in 2008 and the number of students surveyed in countries A, B, C, D and E who liked science in 1998. What was the sample size of the survey conducted in Country F in the year 2010?
- (A) 2,500  
 (B) 4,250  
 (C) 5,500  
 (D) 6,750  
 (E) 9,250
52. All the countries which recorded a percentage change of less than 50% in the number of students who liked science from 1998 to 2008, were surveyed for a second time in 2008 to verify the results. When the same population was surveyed for a second time for those countries, it was found that the data was 900 more than the actual value for 2008. What was the percentage error in plotting the value for 2008?
- (A) 50%  
 (B) 60%  
 (C) 75%  
 (D) 85%  
 (E) 90%
53. If  $\frac{3}{4}$  of all the chocolates have nuts and  $\frac{1}{3}$  of all the chocolates have both nuts and fruits, then what fraction of all the chocolates has nuts but no fruits?
- (A)  $\frac{1}{4}$   
 (B)  $\frac{5}{12}$   
 (C)  $\frac{1}{2}$   
 (D)  $\frac{7}{12}$   
 (E)  $\frac{5}{6}$

54. A mixture of sand and gravel has 6 kg of sand for every 2 kg of gravel. If 200 kg of this mixture is made, how many kg of sand is required?

(A) 25  
(B) 30  
(C) 50  
(D) 100  
(E) 150

55. C is the midpoint of line segment AB. The coordinates of A are (-2, 6) and the coordinates of C are (2, 0). What are the coordinates of B?

(A) (2, 6)  
(B) (2, 0)  
(C) (0, -6)  
(D) (6, -6)  
(E) (3, 0)

56. Which of the following is equal to

$$\left(\frac{\sqrt{12}}{5}\right)\left(\frac{\sqrt{60}}{2^4}\right)\left(\frac{\sqrt{45}}{3^2}\right)?$$

(A)  $\frac{1}{12}$   
(B)  $\frac{1}{6}$   
(C)  $\frac{1}{4}$   
(D)  $\frac{1}{3}$   
(E)  $\frac{1}{2}$

57. Express  $7.58\bar{3}$  as a fraction:

(A)  $\frac{91}{12}$   
(B)  $\frac{44}{6}$   
(C)  $\frac{99}{14}$   
(D)  $\frac{22}{3}$   
(E)  $\frac{148}{21}$

58. Given that  $1176 = 2^p \times 3^q \times 7^r$ , find the value of  $p + q + r$ .

(A) 6  
(B) 8

(C) 9  
(D) 10  
(E) 12

59. If  $3^x - 3^{(x-1)} = 18$ , find x.

(A) 2  
(B) 3  
(C) 5  
(D) 6  
(E) 7

60. If m and n are whole numbers such that  $m^2 = 81$  and m is not greater than 5, find the value of  $(m-1)^2$ .

(A) 16  
(B) 25  
(C) 32  
(D) 88  
(E) 110

61. If the arithmetic mean of two numbers is three times their geometric mean, then the ratio of the numbers can be given by: (Real NMAT Question)

(A)  $(17 - 12\sqrt{2}) : 2$   
(B)  $(17 + 12\sqrt{2}) : 1$   
(C)  $(34 - 24\sqrt{2}) : 1$   
(D)  $(17 + 12\sqrt{2}) : 2$   
(E)  $(33 + 24\sqrt{2}) : 2$

62. The number that is 50% greater than 80 is what percent less than the number that is 25% less than 200?

(A) 5%  
(B) 10%  
(C) 15%  
(D) 20%  
(E) 25%

63. Aakash spends 50% of his income on rent, utilities, and insurance, and 20% on food. If he spends 30% of the remainder on video games and has no other expenditure, what percent of his income is left after all the expenditure?

(A) 30%  
(B) 21%  
(C) 20%  
(D) 9%  
(E) 0%

64. Two circles intersect at points P and Q. A secant passing through P intersects the circles at A and B respectively. Tangents to the circles at Q pass through their respective centres to intersect the circles at A and B, respectively. Tangents to the circles at A and B intersect at T. Then what is  $\angle ATB + \angle AQB = ?$   
(*Real NMAT Question*)
- (A)  $90^\circ$   
(B)  $150^\circ$   
(C)  $180^\circ$   
(D)  $260^\circ$   
(E)  $320^\circ$
65. 50 kg of a product is sold and the profit generated is equal to the cost price of 20 kg of the product. Find the profit percentage made.
- (A) 20%  
(B) 25%  
(C) 35%  
(D) 40%  
(E) 45%
66. A warehouse contains 1,200 shoes in total, 600 shoes for the left foot and 600 shoes for the right foot. Of these 1,200 shoes, 400 shoes are size 8, 400 shoes are size 9 and the remaining 400 shoes are size 10. What is the minimum number of usable shoes? (*Real NMAT Question*)
- (A) 150  
(B) 200  
(C) 250  
(D) 300  
(E) 400
67. Prakash bought a bag of 15 magic pencils for Rs.60. One-third of the pencils cost Rs. 2 each and the rest cost Rs. 5 each. If there was a hole in the bag and all of the more expensive pencils fell out, the lost pencils represented approximately what percentage of the money Prakash paid for all the pencils?
- (A) 7%  
(B) 13%  
(C) 67%  
(D) 83%  
(E) 88%
68. In a class of 40 students, exactly 90% had lower marks than Varun's marks. 60 new students join Varun's class. If Varun's marks were higher than those of 80% of the new arrivals, what percent of the combined class now had higher marks than Varun's marks?
- (A) 86%  
(B) 85%  
(C) 16%  
(D) 15%  
(E) 14%
69. A chemist is mixing a solution of ink and water. She currently has 30 litres of mixture solution, of which 10 litres are ink. How many litres of ink should the chemist add to her current mixture to attain a 50:50 mixture of ink and water if no additional water is added?
- (A) 2.5  
(B) 5  
(C) 10  
(D) 15  
(E) 20
70. A full glass of lemonade is a mixture of 20% lime juice and 80% soda. The contents of the glass are poured into a pitcher that is 200 % bigger than the glass. The remainder of the pitcher is filled with 16 litres of water. What was the original volume of lime juice in the mixture?
- (A) 1.6 litres  
(B) 3.2 litres  
(C) 4.8 litres  
(D) 6.4 litres  
(E) 8 litres
71. Company H distributed Rs. 4,000 and 180 pens evenly among its employees, with each employee getting an equal integer number of Rupees and an equal integer number of pens. What is the highest number of employees that could work for Company H?
- (A) 9  
(B) 10  
(C) 20  
(D) 40  
(E) 180
72. Each factor of 210 is written on a piece of paper, and all the pieces of paper are mixed up. If a piece of paper is randomly picked up from this mix, what is the probability that a multiple of 42 is written on the paper?
- (A)  $\frac{1}{16}$   
(B)  $\frac{5}{42}$

- (C)  $\frac{1}{8}$   
 (D)  $\frac{3}{16}$   
 (E)  $\frac{1}{4}$

**Directions for Questions 73–75:** Go through the following information and solve the questions based on them.

Alok went to an investment consultant to seek guidelines on managing his financial portfolio. The following tables provide the details of the existing structure and the structure proposed by the consultant. His total worth (in Rupees), will remain the same even after a change in the structure as proposed by the consultant.

Current structure	
Equity	28%
Debt	22%
Cash	4%
Real Estate	46%

Proposed structure	
Equity	70%
Debt	25%
Cash	5%

73. If the real estate property of Alok is currently valued at Rs. 69 lakh, what will be the difference in lakhs between equity and debt in the proposed structure?
- (A) Rs. 150 lakh  
 (B) Rs. 9 lakh  
 (C) Rs. 82.5 lakh  
 (D) Rs. 67.5 lakh  
 (E) Rs. 70.5 lakh
74. If the difference between the contribution of equity to that of all the other components put together in the proposed structure is Rs. 16 lakh, find the value of cash in the existing structure.
- (A) Rs. 1.6 lakh  
 (B) Rs. 2 lakh  
 (C) Rs. 2.6 lakh  
 (D) Rs. 4 lakh  
 (E) Cannot be determined

75. By what percentage is the contribution of equity in the proposed structure more as compared to the contribution of equity in the existing structure?
- (A) 42%  
 (B) 100%  
 (C) 120%  
 (D) 150%  
 (E) 200%
76. An increase of 30% in the price of a commodity results in a 21 kg decrease in the quantity of commodity purchased. What was the original amount of the commodity being purchased?
- (A) 52 kg  
 (B) 65 kg  
 (C) 78 kg  
 (D) 83 kg  
 (E) 91 kg
77. If  $t$  is divisible by 12, what is the least possible integer value of  $a$  for which  $\frac{t^2}{2^a}$  might not be an integer?
- (A) 2  
 (B) 3  
 (C) 5  
 (D) 6  
 (E) 40
78. If  $5^{k+1} = 2,000$ , what is  $5^k + 1$ ?
- (A) 399  
 (B) 401  
 (C) 1,996  
 (D) 2,000  
 (E) 2,001
79. Which of the following is equal to  $(\sqrt[2]{x})(\sqrt[3]{x})$ ?
- (A)  $\sqrt[5]{x}$   
 (B)  $\sqrt[6]{x}$   
 (C)  $\sqrt[3]{x^2}$   
 (D)  $\sqrt[5]{x^6}$   
 (E)  $\sqrt[6]{x^5}$

80. If  $125^{14}48^8$  is written out as an integer, how many consecutive zeroes will that integer have at the end?

(A) 22  
(B) 32  
(C) 42  
(D) 50  
(E) 112

**Directions for Questions 81–84:** The following table gives the number of births, deaths and available doctors in four metros of India. Go through the given table and solve the questions based on it. (*Real NMAT Question*)

City	Births (per '000 per year)	Deaths (per '000 per year)	Number of Doctors (per '000)	Population (Lakh)
Mumbai	250	120	20	100
Kolkata	180	80	50	110
Delhi	150	110	30	120
Chennai	140	70	50	50

81. Which city/cities has the highest death rate per available doctor?

(A) Mumbai  
(B) Kolkata  
(C) Delhi  
(D) Chennai  
(E) Delhi and Mumbai

82. If improved healthcare reduces the death rate in Mumbai by 10%, then by what percentage does the population growth increase?

(A) 7%  
(B) 8.5%  
(C) 9.2%  
(D) 10.1%  
(E) 11.3%

83. Which city/cities has/have the highest number of deaths in a year?

(A) Mumbai  
(B) Kolkata  
(C) Delhi  
(D) Chennai  
(E) Mumbai and Chennai

84. Which of the given cities would have recorded the highest increase in the population in a year?

(A) Mumbai  
(B) Kolkata  
(C) Delhi  
(D) Chennai  
(E) Delhi and Chennai

85. In what quantities should an alloy containing copper and zinc in the ratio 2:1 be mixed with another alloy containing copper and zinc in the ratio 4:5 to get 64 kg of a new alloy with equal quantities of copper and zinc?

(A) 48 kg, 16 kg  
(B) 24 kg, 40 kg  
(C) 32 kg each  
(D) 16 kg, 48 kg  
(E) 24 kg each

86. If  $n$  is the smallest of three consecutive positive integers, which of the following must be true?

(A)  $n$  is divisible by 3  
(B)  $n$  is even  
(C)  $n$  is odd  
(D)  $n(n+2)$  is even  
(E)  $n(n+1)(n+2)$  is divisible by 3

87. If  $\frac{17}{2^{10} \times 5^{13}}$  is expressed as a terminating decimal, how many zeroes are located to the right of the decimal point before the first non-zero digit?

(A) 10  
(B) 12  
(C) 13  
(D) 15  
(E) 17

88. If  $25^5 4^6 = 10^x + a$ , and  $x$  is an integer, what could be the minimum positive value of  $a$ ?

(A) 0  
(B) 30,000  
(C) 30,000,000  
(D) 10,000,000,000  
(E) 30,000,000,000



89. What is the unit digit of  $7^{96}$ ?
- (A) 0  
(B) 1  
(C) 3  
(D) 7  
(E) 9
90. What minimum number must be subtracted from 247 so that the number is divisible by both 6 and 7?
- (A) 35  
(B) 36  
(C) 37  
(D) 38  
(E) 39
91. A man can row at 5 km/h in still water. If the speed of the stream is 1 km/h and it takes 1 h to row to a place and come back, how far is the place?
- (A) 2.4 km  
(B) 2.5 km  
(C) 3 km  
(D) 3.6 km  
(E) 4.2 km
92. The price of an item goes down by 9% whereas the sales of the item go up by 12%. The net effect on revenue is: (Real NMAT Question)
- (A) 1% loss  
(B) 1% gain  
(C) 1.92% loss  
(D) 1.92% gain  
(E) Cannot be determined
93. There are 20 seats on a bus with the price of each ticket being Rs. 100. Because of inflation, the price of a ticket is increased by 10%, but in trying to provide better facilities the numbers of seats have to be decreased by 10%. What is the percentage change in the overall collection per trip before and after the change assuming all seats are being occupied?
- (A) increased by 1%  
(B) decreased by 1%  
(C) decreased by 3%  
(D) increased by 3%  
(E) decreased by 10%
94. It costs a certain chair manufacturing unit Rs. 11,000 to operate for one month, plus Rs. 300 for each chair produced during the month. Each of

the chairs sells for a retail price of Rs. 700. What is the minimum number of chairs that the manufacturing unit must sell in one month to make a profit?

- (A) 26  
(B) 27  
(C) 28  
(D) 29  
(E) 30
95. A ski resort has enough wood to keep 20 rooms heated for 14 days. If the resort decides to save wood by turning off the heat in 5 unoccupied rooms, and each room requires the same amount of wood to heat it, how many extra FULL days will the wood supply last?
- (A) 3  
(B) 4  
(C) 5  
(D) 18  
(E) 19
96. The total surface area of a solid hemisphere is  $1,848 \text{ cm}^2$ . What is the circumference of its circular base? (Real NMAT Question)
- (A) 14 cm  
(B) 22 cm  
(C) 34 cm  
(D) 44 cm  
(E) 88 cm
97. Three people sit down to eat 14 pieces of cake. If two of the people eat the same number of pieces, and the third person eats two more pieces than each of the other two, how many pieces are eaten by the third person?
- (A) 3  
(B) 4  
(C) 5  
(D) 6  
(E) 7
98. A person travels from his home to his office every day covering the same distance. If he has to decrease the time taken today by 6.66%, by what percentage should the speed be increased?
- (A) 7.14%  
(B) 8.24%  
(C) 9.33%  
(D) 10.22%  
(E) 11.34%

99. There are three coloured beads: red, blue and yellow, and each colour has a different value. If the value of a red bead plus a blue bead is 4.25, the value of a blue bead plus a yellow bead is 2.75, and the value of a red bead plus a blue bead plus a yellow bead is 4.5, what is the value of a red bead plus a yellow bead?

(A) 0.25  
(B) 2  
(C) 2.25  
(D) 2.75  
(E) 3

Directions for Questions 100–103: Answer the questions on the basis of the table given below.

(Real NMAT Question)

The table below shows the number of people employed in the public and private sector in a country in the years 2005, 2006, 2007 and 2008. All the values are in '000.

100. What is the difference of yearly growth rate in employment between 2006–2007 and 2007–2008?

(A) 0.0002  
(B) 0.0003  
(C) 0.0006  
(D) 0.0007  
(E) 0.0009

101. What percentage of the total employment did the private sector contribute in 2006?

(A) 31.9%  
(B) 32.2%  
(C) 32.3%  
(D) 32.6%  
(E) 32.7%

102. What percentage of the total employment did the public sector contribute in 2007?

(A) 64.9%  
(B) 65.2%  
(C) 66.0%  
(D) 66.2%  
(E) 66.7%

103. What was the ratio of private sector employment to public sector employment in 2008?

(A) 14 : 25  
(B) 14 : 23  
(C) 7 : 11  
(D) 2 : 31  
(E) 7 : 10

104. The Simple Interest for 10 years is Rs. 6,000. The Compound Interest for 2 years is Rs. 1,400. Find the rate percentage and the principal.

(A) 33.33%, 1,600  
(B) 30%, 1,800  
(C) 33.33%, 1,800  
(D) 66.66%, 1,600  
(E) 35%, 1,500

105. A and B can do a work in 20 and 25 days, respectively. With the help of C and D, they finish the same work in 5 days. If the efficiency of C is half that of A, find the total time taken by D to finish the work alone.

(A)  $\frac{100}{17}$   
(B) 12  
(C)  $\frac{200}{17}$   
(D) 15  
(E) 20

Year	Public Sector					Private Sector		Total
	Central Govt	State Govt	Quasi Govt		Local Bodies	Large Estt.	Small Estt.	
			Central	State				
2005	2,938.5	7,201.9	3,284.7	2,463.6	2,117.9	7,489.1	962.7	26,458.4
2006	2,860.0	7,300.0	3,469.0	2,440.0	211.0	7,804.0	1,001.1	26,992.0
2007	2,800.0	7,209.9	3,447.0	2,414.0	2,132.0	8,229.0	1,046.0	27,277.0
2008	2,739.0	7,171.0	3,389.0	2,407.0	1,968.0	8,832.0	1,043.0	27,549.0

106. A pipe can fill a tank alone in 12 h while a leak can empty it in 16 h. If the efficiency of the pipe is increased by 25% while that of the leak is halved, find the time taken to fill 75% of the tank.
- (A)  $\frac{36}{7}$  h  
(B)  $\frac{60}{7}$  h  
(C)  $\frac{48}{7}$  h  
(D)  $\frac{72}{7}$  h  
(E)  $\frac{83}{7}$  h
107. National Cricket Academy offers two different pricing packages for cricket coaching. Under the 'Regular' pricing plan, classes can be bought for a flat rate of Rs. 80 per hour. Under the 'Exclusive' pricing plan, after paying an initial fee of Rs. 495, classes can be availed for a rate of Rs. 15 per hour. If Karan buys the 'Exclusive' pricing plan, how many classes does he need to take in order to have spent exactly 40% less than he would have under the 'Regular' plan?
- (A) 10  
(B) 12  
(C) 15  
(D) 18  
(E) 20
108. Three boys can do the same work as one woman. If a work is completed by 36 boys in 28 days working 9 h every day, how many women must be required to complete the same work in 7 days working 6 h every day?
- (A) 36 women  
(B) 48 women  
(C) 54 women  
(D) 66 women  
(E) 72 women
109. If the two hands of an incorrect clock coincide after every 67 min, how many minutes does the incorrect clock lose in a day?
- (A) 32.21 min  
(B) 33.11 min  
(C) 33.21 min  
(D) 34.11 min  
(E) 34.31 min
110. Machines X and Y pack books continuously, each working at a constant rate, but Machine Y works 50% faster than Machine X. If Machine Y packs 48,000 more books in a 24-hour period than Machine X does, what is Machine X's packing rate in books per hour?
- (A) 4,000  
(B) 6,000  
(C) 8,000  
(D) 12,000  
(E) 16,000
111. A warehouse stores 345 litres of HCl, 120 litres of  $H_2SO_4$  and 225 litres of  $NH_3$ . What is the biggest size of the cask in which the acids can be stored? **(Real NMAT Question)**
- (A) 10 litres  
(B) 15 litres  
(C) 25 litres  
(D) 35 litres  
(E) 40 litres
112. At what time between 7 and 8 pm will the angle between the minute and hour hands of a clock be equal to half the angle between the minute and hour hands of a clock at 7 pm?
- (A) 7 min past 7 pm  
(B) 12 min past 7 pm  
(C) 15 min past 7 pm  
(D) 17 min past 7 pm  
(E) 19 min past 7 pm
113. The height of a person is directly proportional to the square root of his age. At the age of 16, his height is 4 ft. What will be the height of the person when he is 25 years old?
- (A) 4.25 ft.  
(B) 4.75 ft.  
(C) 5 ft.  
(D) 5.5 ft.  
(E) 6 ft.
114. If 31 March 2017 is a Saturday, find the day of the week on 1 January 2014.
- (A) Wednesday  
(B) Friday  
(C) Thursday  
(D) Monday  
(E) Tuesday

115. A number when divided successively by 5 and 2 gives remainders of 3 and 1, respectively. What will be the remainder when the largest such two-digit number is divided by 12? (*Real NMAT Question*)
- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5
116. A bus started driving towards the North from point X, travelling at a constant rate of 40 km per hour. An hour later, a truck started driving towards the North from the same point X at a constant rate of 30 km per hour. If each vehicle started with 8 litres of diesel, that was consumed at a rate of 30 km per litre, how many kilometres apart were the two vehicles when the bus ran out of fuel?
- (A) 30  
(B) 60  
(C) 90  
(D) 120  
(E) 150
117. Working alone at their respective constant rates, Ajay can complete a certain job in 4 hours, while Firoz can do the same job in 3 hours. Ajay and Firoz worked together on the job and completed it in 2 hours, but while Ajay worked this entire time, Firoz worked for some of the time and took 3 breaks of equal length. How many minutes long were each of Firoz' breaks?
- (A) 5 minutes  
(B) 10 minutes  
(C) 15 minutes  
(D) 20 minutes  
(E) 25 minutes
118. A truck uses 10 km/litre of petrol when it is unloaded. When the truck is loaded, it travels only 80% as far on a litre of petrol as when unloaded. How many litres will the loaded truck use to travel 80 km? (*Real NMAT Question*)
- (A) 4 litres  
(B) 6 litres  
(C) 7 litres  
(D) 8 litres  
(E) 10 litres
119. In colony A, there are 12 houses with an average of 4 members per house, while in colony B, there are 20 houses with an average of Y members per house. If the two colonies together have an average of 3.5 members per house, find Y.
- (A) 3.2  
(B) 3.6  
(C) 4.8  
(D) 5.4  
(E) 6.2
120. Three years ago, the ratio of the ages of a father and a son was 6:1. After 3 years, the ratio will be 36:11. Find the present age of the son.
- (A) 3 years  
(B) 5 years  
(C) 8 years  
(D) 11 years  
(E) 17 years
121. A man rows a distance of 4 km in 1 hour in still water and in 45 minutes with the current. How much time would he take to row 10 km with the current and return to the starting point? (*Real NMAT Question*)
- (A) 2 hr 17.5 min  
(B) 3 hr 47.5 min  
(C) 4 hr 27.5 min  
(D) 5 hr 37.5 min  
(E) 6 hr 39 min
122. Arvind sells clothes at a roadside market for which he pays Rs. 150 per day to rent a table plus Rs. 10 per hour to his salesman. He sells an average of Rs. 78 worth of clothes per hour. Assuming no other costs, which of the functions below best represents profit per day P in terms of hours h that Arvind works for?
- (A)  $P(h) = 238 - 10h$   
(B)  $P(h) = 72 - 10h$   
(C)  $P(h) = 68h - 150$   
(D)  $P(h) = 78h - 160$   
(E)  $P(h) = -160h + 78$
123. The price of two cups, seven pans and four saucers is Rs. 110 while that of one cup and two saucers is Rs. 20. Find the price of three pans.
- (A) 30  
(B) 40  
(C) 60  
(D) 70  
(E) 80

124. What is the highest power of 2 in the expression  $(2^{10} - 1)$ ? (Real NMAT Question)
- (A)  $2^5 - 1$   
 (B)  $2^7 - 6$   
 (C)  $2^8 - 9$   
 (D)  $2^9 - 10$   
 (E)  $2^{10} - 11$
125. In a college dramatics team, the ratio of boys to girls is 6 : 7. If there are 2 more girls than boys in the team, how many boys are in the team?
- (A) 12  
 (B) 18  
 (C) 24  
 (D) 30  
 (E) 36
126. Three solutions with milk and water in the ratio 2:3, 3:1 and 4:5, respectively, were mixed in the ratio 2:3:4. Find the ratio of milk to water in the resultant mixture.
- (A) 869:751  
 (B) 219:341  
 (C) 420:519  
 (D) 531:622  
 (E) 640:729
127. A certain number of teams participated in a charity Rugby tournament. Each team played with every other team participating in the tournament exactly once. If the number of matches played in the tournament is 120, then how many teams participated in the tournament? (Real NMAT Question)
- (A) 8  
 (B) 10  
 (C) 14  
 (D) 15  
 (E) 16
128. The cost price of a pencil is twice the cost price of an eraser. Reyyansh purchased three times more pencils than erasers from a shop for a total price of Rs. 108. If a pencil and an eraser cost Rs. 4.5, find the number of pencils purchased by Reyyansh.
- (A) 8  
 (B) 10  
 (C) 24  
 (D) 32  
 (E) 48

129. The arithmetic mean and geometric mean of the intercepts of a line in respective order equals 15 and 12. Which of the following could be the slope of the line? (Real NMAT Question)
- (A)  $-\frac{1}{8}$   
 (B)  $-\frac{1}{4}$   
 (C)  $\frac{1}{4}$   
 (D) 2  
 (E) 4
130. If the sum of the roots of an equation is  $\frac{5}{3}$  times the product of the roots, find the relation between b and c.
- (A)  $b = \frac{5c}{3}$   
 (B)  $b = \frac{3c}{5}$   
 (C)  $b = -\frac{5c}{3}$   
 (D)  $b = -\frac{3c}{5}$   
 (E)  $b = \frac{2c}{5}$
131. For a cricket match team selection, 2 batsmen, 3 bowlers, and 1 wicketkeeper are to be picked. There are 23 players available to play as batsmen, 21 other players available to play as bowlers, and 9 other players available to play as wicketkeepers. If the maximum possible number of complete sets of 6 players are formed, how many of the available players will not be on a team?
- (A) 7  
 (B) 9  
 (C) 11  
 (D) 13  
 (E) 15
132. The population of a country increased at the rate of 6% per year. If the present population of the country is 23,452 million, what was the approximate population of the country 3 years ago? (Real NMAT Question)
- (A) 18,765 million  
 (B) 18,967 million

(C) 19,691 million

(D) 20,872 million

(E) 21,432 million

133. Which of the following describes all possible solutions to the inequality  $|a + 4| < 7$ ?

(A)  $a < 3$ (B)  $a > -11$ (C)  $3 > a > -11$ (D)  $-11 > a > 3$ (E)  $a > 11$  or  $a < -11$ 

134. If the fourth and ninth terms of a Harmonic

Progression are  $\frac{1}{10}$  and  $\frac{1}{25}$ , then find the series.

(Real NMAT Question)

(A)  $1, \frac{1}{4}, \frac{1}{7}, \dots$ (B)  $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$ (C)  $\frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \dots$ (D)  $1, \frac{1}{3}, \frac{1}{7}, \dots$ 

(E) None of the above

135. A cricketer practises one hour a day from Monday to Friday. How many hours must he practise on Saturday in order to have an average (arithmetic mean) of 2 hours of practice every day for the 6-day period?

(A) 3

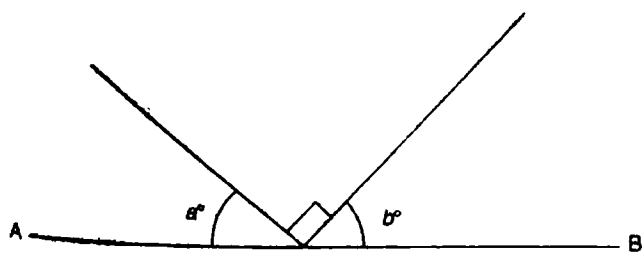
(B) 5

(C) 7

(D) 9

(E) 11

136. In the figure given what is the value of  $a + b$ ?

(A)  $30^\circ$ (B)  $60^\circ$ (C)  $90^\circ$ (D)  $100^\circ$ (E)  $180^\circ$ 

137. Two trains start from A and B and travel towards B and A, respectively. Their speeds are 80 km/h and 95 km/h, respectively. When they meet, it is found that one train has travelled 165 km more than the other. What is the distance of A to B?

(A) 1,650 km

(B) 1,700 km

(C) 1,825 km

(D) 1,890 km

(E) 1,925 km

138. If  $a$ ,  $b$  and  $c$  are in arithmetic progression, then  $a + b$ ,  $b + c$ ,  $c + a$  (in any order) can be in:

(Real NMAT Question)

(A) arithmetic progression.

(B) geometric progression.

(C) harmonic progression.

(D) arithmetic or geometric progression.

(E) arithmetic or geometric or harmonic progression.

139. A machine can manufacture 20 pens per hour, and exactly 10 such pens fit into every box. Mahesh packs pens in boxes at a constant rate of 3 boxes per hour. If the machine ran for 2 hours and was then turned off before Mahesh started packing the pens in boxes, how many minutes would it take Mahesh to pack all the pens that the machine had made?

(A) 40 minutes

(B) 45 minutes

(C) 80 minutes

(D) 160 minutes

(E) 800 minutes

140. A can do a job in 20 days and B can do the same job in 30 days. They are working on alternate days, with A starting the job. In how much time will the work get completed?

(A) 22

(B) 24

(C) 28

(D) 30

(E) 34

141. This problem consists of a question and two statements, labelled (1) and (2), in which certain data are given. Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

(Real NMAT Question)

Is  $x^2 + y^3$  odd?

(1)  $x^2y = 48$

(2)  $xy^2 = 36$

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
 (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
 (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
 (D) EACH statement ALONE is sufficient.  
 (E) Statements (1) and (2) TOGETHER are NOT sufficient.

142. If the average of  $a$ ,  $b$ ,  $c$ , 5, and 6 is 6, what is the average of  $a$ ,  $b$ ,  $c$ , and 13?

- (A) 8  
 (B) 8.5  
 (C) 9  
 (D) 9.5  
 (E) 10.5

143. Two apples and five bananas cost Rs. 17, while three apples and four bananas cost Rs. 15. What is the price of an apple?

- (A) Rs. 1  
 (B) Rs. 1.50  
 (C) Rs. 2  
 (D) Rs. 2.50  
 (E) Rs. 3

144. A question is followed by two statements, labelled (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

(Real NMAT Question)

What is the radius of the circle inscribed in  $\triangle ABC$ ?

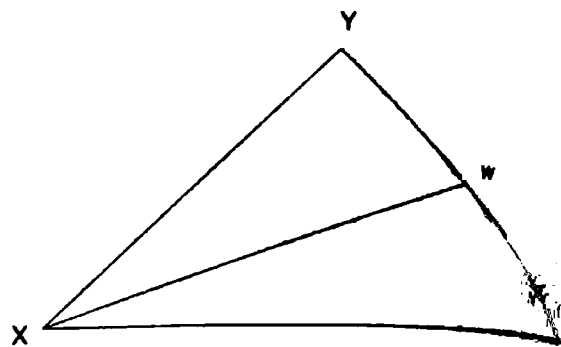
(1)  $\triangle ABC$  is a right angled triangle with hypotenuse = 5 cm.

(2)  $\triangle ABC$  is an equilateral triangle with side = 6 cm.

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
 (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.

- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
 (D) EACH statement ALONE is sufficient.  
 (E) Statements (1) and (2) TOGETHER are NOT sufficient.

145. In the figure given if  $XW$  bisects  $\angle X$ , and if  $\angle Y = 40^\circ$  and  $\angle Z = 60^\circ$ , what is the measure of  $\angle YXW$ ?



- (A)  $20^\circ$   
 (B)  $30^\circ$   
 (C)  $35^\circ$   
 (D)  $40^\circ$   
 (E)  $60^\circ$

146. A question is followed by two statements, labelled (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

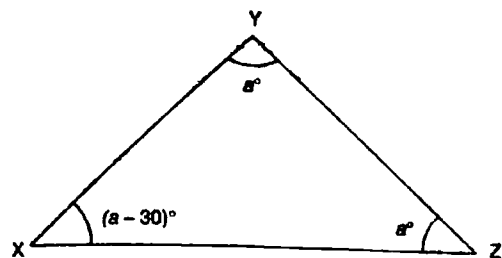
(Real NMAT Question)

Is the positive integer ' $x$ ' an even number?

- (1)  $x$  when divided by 3 leaves a remainder of 1  
 (2)  $x$  when divided by 5 leaves a remainder of 1

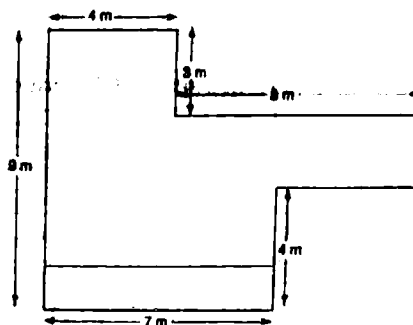
- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
 (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
 (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
 (D) EACH statement ALONE is sufficient.  
 (E) Statements (1) and (2) TOGETHER are NOT sufficient.

147. In the triangle given which of the following must be true?



- (A)  $XY = YZ$   
 (B)  $YZ = XZ$   
 (C)  $\angle X > 50^\circ$   
 (D)  $\angle Y = 50^\circ$   
 (E)  $XY = XZ$
148. Which of the following exponentials is the largest?  
 (Real NMAT Question)
- (A)  $3^{34}$   
 (B)  $5^{15}$   
 (C)  $6^{16}$   
 (D)  $7^{16}$   
 (E)  $16^{12}$
149. X cornflake is 55% fibre and Y cornflake is 70% fibre. Sharad combines a certain amount of the two cereals in a single bowl, creating a mixed cereal that is 65% fibre. If the bowl contains 120 grams of cereal, how much of the cereal, in grams, is X?
- (A) 30  
 (B) 40  
 (C) 60  
 (D) 80  
 (E) 90
150. As per a weather forecast, the probability of hail is  $\frac{1}{6}$  for any given day next week. What is the chance that there will be hail on both Thursday and Friday?
- (A)  $\frac{1}{36}$   
 (B)  $\frac{1}{12}$   
 (C)  $\frac{1}{6}$   
 (D)  $\frac{1}{3}$   
 (E)  $\frac{2}{3}$

151. (Real NMAT Question)



In the adjoining plots of land shown above, all the adjacent sides are at right angles. Find the perimeter of the total land.

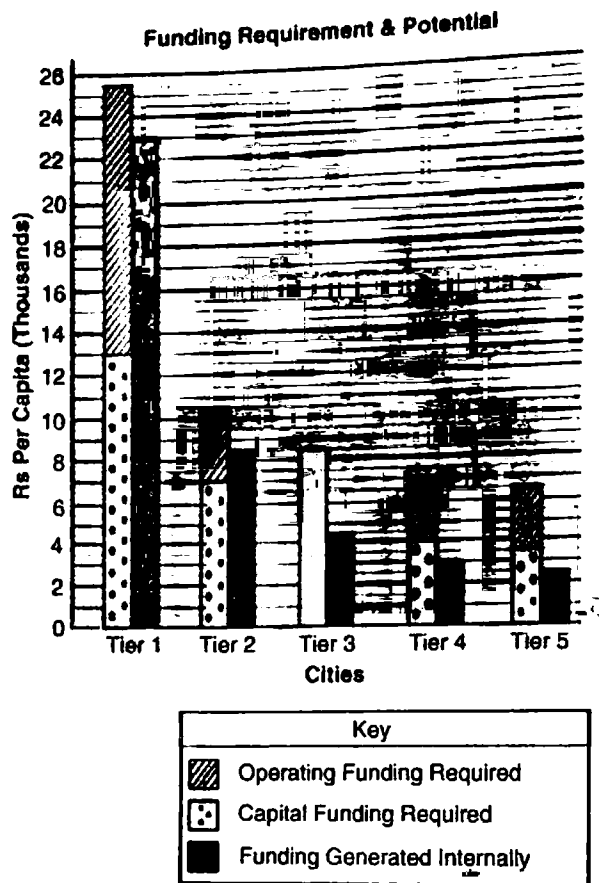
- (A) 40 m  
 (B) 41 m  
 (C) 42 m  
 (D) 43 m  
 (E) 44 m
152. A 4-inch wide gold frame is placed around a rectangular photograph with dimensions 6 inch by 8 inch. What is the cost of framing this photograph if gold framing costs Rs. 100 per square inch?
- (A) 72  
 (B) 176  
 (C) 7,200  
 (D) 17,600  
 (E) 20,200

**Directions for Questions 153–156:** The graph provided on the next page shows the funding requirements and funding potential for various categories of cities in a country during a certain year. Some data for Tier 3 cities is missing from the graph. Go through the given graph and solve the questions based on it. (Real NMAT Question)

153. What percentage of the total funding requirements of Tier 1 and Tier 2 cities combined was their capital funding requirements?
- (A) 34.6%  
 (B) 42.7%  
 (C) 53.5%  
 (D) 55.6%  
 (E) 61.0%
154. Which category of cities was able to meet about 53% of its required funding by way of internal funding?
- (A) Tier 1  
 (B) Tier 2  
 (C) Tier 3



- (D) Tier 4  
(E) Tier 5



**Note:** Total funding requirements is the sum of operating funding and capital funding requirements.

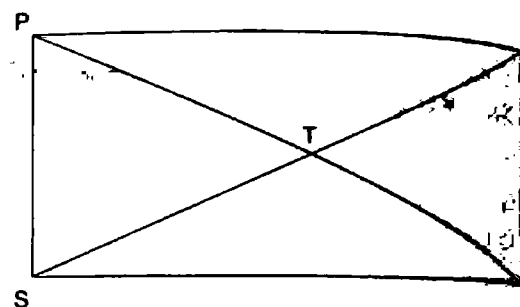
155. The ratio of the capital funding of Tier 3 cities to the total capital funding of Tier 4 and Tier 5 cities combined was 2 : 3. What was the ratio of the capital funding to operative funding for Tier 3 cities?
- (A) 8 : 7  
(B) 7 : 5  
(C) 10 : 7  
(D) 3 : 2  
(E) 5 : 3
156. About 60% of the funding deficit of Tier 5 cities has to come from state governments and the remaining from the central government. If 30% of the funding from the central government comes as ad hoc grants, what is the per capita funding from central government that comes as ad hoc grants?
- (A) Rs. 480 per capita  
(B) Rs. 520 per capita  
(C) Rs. 560 per capita

- (D) Rs. 590 per capita  
(E) Rs. 620 per capita

157. How many five-digit numbers can be formed using the digits 5, 6, 7, 2, 9, 0 if no digits can be repeated?

- (A) 64  
(B) 120  
(C) 240  
(D) 600  
(E) 720

158. In the figure given PQRS is a rectangle. If the area of  $\Delta STR$  is 20, what is the area of  $\Delta SPR$ ?



- (A) 20  
(B) 25  
(C) 30  
(D) 35  
(E) 40

159. A classroom has 12 girls and 20 boys.  $\frac{1}{4}$  of the girls in the class have cell phones. If a child is selected random from the class, what is the probability that is a girl who does not have a cell phone?

- (A)  $\frac{3}{32}$   
(B)  $\frac{9}{32}$   
(C)  $\frac{3}{8}$   
(D)  $\frac{23}{32}$   
(E)  $\frac{29}{32}$

160. In how many different ways can 10 students of a class with roll numbers from 1 to 10 be seated in a straight line such that one of the extreme positions has a student with an odd roll number while the other extreme position has a student with an even roll number?

- (A)  $48 \times 6!$   
 (B)  $44 \times 12!$   
 (C)  $50 \times 8!$   
 (D)  $50 \times 6!$   
 (E)  $52 \times 8!$

161. What is the probability that the month of May will have five Tuesdays?

- (A)  $\frac{2}{3}$   
 (B)  $\frac{2}{5}$   
 (C)  $\frac{3}{5}$   
 (D)  $\frac{3}{7}$   
 (E)  $\frac{3}{8}$

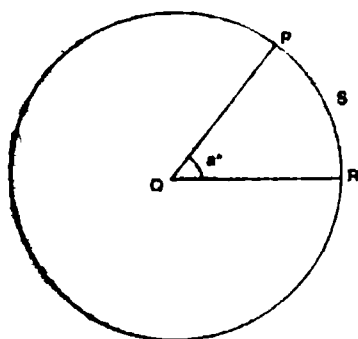
162. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.  
 (Real NMAT Question)

What are the values of 3 integers  $a$ ,  $b$  and  $c$ ?

- (1)  $ab = 8$   
 (2)  $bc = 9$

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
 (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
 (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
 (D) EACH statement ALONE is sufficient.  
 (E) Statements (1) and (2) TOGETHER are NOT sufficient.

163. In the figure given the ratio of the length of minor arc PSR to the circumference of the circle Q is 1:9. What is the measure of  $\angle a$ ?



- (A)  $30^\circ$   
 (B)  $40^\circ$   
 (C)  $45^\circ$   
 (D)  $50^\circ$   
 (E)  $60^\circ$

164. If  $P - Q = 1$  and  $R - S = 1$ , then which of the following is necessarily odd? (Real NMAT Question)

- (I)  $\frac{(P+Q)}{(R+S)}$   
 (II)  $\frac{(P+R)}{(Q+S)}$   
 (III)  $PR(P+Q)$   
 (IV)  $PQ + RS$

- (A) Only (I)  
 (B) (I) and (II)  
 (C) (I) and (III)  
 (D) (II) and (III)  
 (E) (I) and (IV)

165. A cube has sides numbered 1 through 6. If the cube is rolled three times, what is the probability that at least one of the rolls will result in a number higher than 4?

- (A)  $\frac{13}{19}$   
 (B)  $\frac{11}{13}$   
 (C)  $\frac{14}{19}$   
 (D)  $\frac{19}{27}$   
 (E)  $\frac{12}{31}$

166. Five friends, Akshita, Binod, Chetan, Dravid, and Eshan are to be arranged in a line. How many such arrangements are possible if Binod is not allowed to stand next to Dravid?

- (A) 24  
 (B) 48  
 (C) 72  
 (D) 96  
 (E) 120

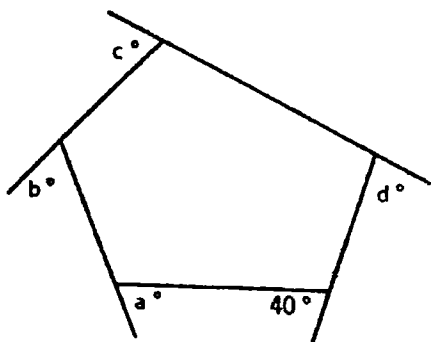
167. How many times will the digit 5 be used to write numbers from 1 to 7,700 in base 8?  
 (Real NMAT Question)

- (A) 1,456  
(B) 2,048  
(C) 2,540  
(D) 2,611  
(E) 2,632
168. If the radius of the base of a right circular cylinder is  $r$  and its volume is  $\left(\frac{66}{7}\right)r^2 \text{ cm}^3$ , find the height of the cylinder.  
(A) 3 cm  
(B) 4 cm  
(C) 6 cm  
(D) 7 cm  
(E) 9 cm
169. Pipe A can fill a tank in 5 hours, while Pipe B can empty the tank in 6 hours. If both the pipes are opened simultaneously, how much time will it take to fill the tank completely? *(Real NMAT Question)*  
(A) 11 hr  
(B) 30 hr  
(C) 45 hr  
(D)  $\frac{11}{30}$  hr  
(E)  $2\frac{8}{11}$  hr
170. There is an 80% chance that Deeksha will skip her lunch and 25% chance that there will be a power failure. If these events are independent, what is the probability that Deeksha will skip her lunch OR that there will be a power failure?  
(A) 20%  
(B) 80%  
(C) 85%  
(D) 95%  
(E) 105%
171. Raju can do a piece of work in 30 days. After working for 3 days, he takes leave and the remaining work is completed by Sunny in 27 days. Which of the following could be the time taken by Sunny to complete the work alone? *(Real NMAT Question)*  
(A) 20 days  
(B) 27 days  
(C) 30 days  
(D) 35 days  
(E) 45 days
172. Eleven players are to be selected for a match out of an available list of 14 players. In how many ways can this be done such that the best two identified players are always selected?  
(A)  ${}^{14}C_{11}$   
(B)  ${}^{12}P_9$   
(C)  ${}^{12}C_9$   
(D)  ${}^{12}C_9 \times 2!$   
(E)  ${}^{12}C_{11}$
173. An online book company reported that it sold 143 eBooks for every 100 hardbacks, over a period of 6 months. If the company sold 94,500 hardbacks during that time, how many eBooks did it sell? *(Real NMAT Question)*  
(A) 14,300  
(B) 94,643  
(C) 1,08,800  
(D) 1,35,135  
(E) 1,41,750
174. A 12 inch  $\times$  16 inch rectangular picture is displayed in an 18 inch  $\times$  30 inch rectangular frame. What is the area of the part of the frame not covered by the picture?  
(A) 150 square inches  
(B) 244 square inches  
(C) 264 square inches  
(D) 348 square inches  
(E) 384 square inches
175. What is the remainder when  $\frac{44^{63} \times 44^3}{44^{11}}$  is divided by 7? *(Real NMAT Question)*  
(A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5
176. Eight students were to be seated along two rows such that four students will be seated in each of the two rows called A and B. Two of the eight students definitely want to be seated in row A while one of them definitely wants to be seated in row B. In how many different ways can the eight students be seated?  
(A) 5,760  
(B) 5,960  
(C) 6,500

(D) 6,760

(E) 7,160

177. What is the value of  $a + b + c + d$ ?

(A)  $240^\circ$ (B)  $320^\circ$ (C)  $360^\circ$ (D)  $500^\circ$ (E)  $540^\circ$ 

178. During the morning assembly in a school, all the students can stand in rows so that each row has 8, 10 or 12 students. Which of the following could be the least number of students in the school?  
(Real NMAT Question)

(A) 20

(B) 30

(C) 60

(D) 100

(E) 120

179. Mr. X wants to buy a total of 100 fruits using exactly a sum of Rs. 1,000. He can buy mango at Rs. 20 per unit, apple at Rs. 5 per unit or banana at Rs. 1 per unit. If he has to buy at least one of each fruit and cannot buy any other type of fruit, then in how many distinct ways can he make his purchase?

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

180. A question is followed by two statements, labelled (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.  
(Real NMAT Question)

Is the mean of Set A greater than the mean of Set B?

Set A = {5, 15, x, 12, 14};  $x > 0$

Set B = {y, 7, 13, 8, 18};  $y > 0$

(1)  $x = y$ 

(2) Median of Set A &gt; Median of Set B

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

181. A solid cube with side length of 2 feet is cut into 2 inch x 2 inch x 4 inch cuboids. What is the ratio of the total surface area of all the resulting cuboids to the surface area of the original cube? (1 foot = 12 inches)

(A) 2 : 1

(B) 4 : 1

(C) 5 : 1

(D) 8 : 1

(E) 10 : 1

182. A sector of a circle having radius of 4 units has an area of  $4\pi$  square units. What is the arc length of the sector?

(A)  $\pi$  units(B)  $2\pi$  units(C)  $4\pi$  units(D)  $6\pi$  units(E)  $8\pi$  units

183. Let a right circular cylinder's radius be  $r$  and height be  $h$ . What will be the change in volume of this cylinder if  $r$  becomes  $\frac{r}{2}$  and  $h$  becomes  $2h$ ?

(A) 50% decrease

(B) No change

(C) 25% increase

(D) 50% increase

(E) 100% increase

184. What is the probability that a card drawn at random from a pack of cards is either black or a jack?

(A)  $\frac{17}{52}$ (B)  $\frac{7}{13}$

(C)  $\frac{27}{52}$

(D)  $\frac{3}{13}$

(E)  $\frac{5}{9}$

185. A batch of clips costs Rs.  $(p + 15)$  for a company to produce and each batch sells for Rs.  $p (9 - p)$ . For which of the following values of  $p$  does the company make a profit?

- (A) 3  
(B) 4  
(C) 5  
(D) 6  
(E) 7

186. Bag A contains 3 white and 3 red beads. Bag B contains 6 white and 3 red beads. One of the two bags will be chosen at random, and then two beads will be drawn from that bag at random without replacement. What is the probability that the two beads drawn will be of the same colour?

- (A)  $\frac{7}{20}$   
(B)  $\frac{9}{10}$   
(C)  $\frac{9}{20}$   
(D)  $\frac{11}{20}$   
(E)  $\frac{13}{20}$

187. What is the difference between the sum of all even positive integers between 1 and 100 (inclusive) and the sum of all odd positive integers between 100 and 150?

- (A) -575  
(B) -475  
(C) 225  
(D) 475  
(E) 575

188. Two students are selected from a class of 5 girls and 12 boys. Find the probability that a particular pair of girl and boy is selected.

- (A)  $\frac{1}{136}$   
(B)  $\frac{1}{63}$

(C)  $\frac{1}{51}$

(D)  $\frac{10}{21}$

(E)  $\frac{13}{61}$

**Data for Questions 189–191:** Two thousand students applied for admission to the various programs at AU University. Out of the total applicants, 20% did not write the admission test. The following table gives the cumulative frequency in percentage of the mark range received by those students who appeared for the admission test.

Marks	Cumulative frequency (%)
$\leq 10$ marks	15
$\leq 20$ marks	25
$\leq 30$ marks	40
$\leq 40$ marks	60
$\leq 50$ marks	85
$\leq 60$ marks	100

189. What is the number of students who got marks in the range of 21–30 in the admission test?

- (A) 120  
(B) 240  
(C) 360  
(D) 400  
(E) 640

190. If more than 40 marks are required to qualify for the next round, find the difference between the number of students who qualified for the next round and those who failed to qualify for the next round.

- (A) 160  
(B) 240  
(C) 320  
(D) 380  
(E) 420

191. By what percentage is the number of students in the range of 41–50 marks more than those in the range of 0–10 marks?

- (A) 10%  
(B) 20%

- (C) 30%
- (D) 33.33%
- (E) 66.66%

192. A milkman mixes water and milk in the ratio 3 : 4. As one of his customers was not home, he had to deliver less milk. So he decided to decrease the dilution, for which he took out 5 litres of mixture and added 1 litre of milk. The ratio of water to milk then changed to 2 : 5. How many litres of mixture did he have initially? (*Real NMAT Question*)

- (A) 4
- (B) 5
- (C) 6
- (D) 7
- (E) 8

**Data for Questions 193–195:** A person was looking at the performance data of four companies namely A, B, C and D for the year 2014. He observed that the sale of company A for the year 2014 was twice the expenses for company D in the same year. The profit for company C in the year 2014 was 25% while its sale was Rs. 300 crore. The ratio of the sales of company B and the expenses of company D was 4:5. Also, the expenses of company B were half of the total expenses of company D in the same year.

It was also observed that the sale of company D was Rs. 250 crore while its profit for the year was Rs. 150 crore. Also, the expenses of company A in the year 2014 were such that its profit was 50%.

(For the questions based on the above data, consider, Profit = Sale – Expenses)

193. What is the profit percentage of company B in the year 2014?

- (A) 35%
- (B) 40%
- (C) 50%
- (D) 55%
- (E) 60%

194. Find the value of profit of company A in the year 2014.

- (A) Rs. 33.33 crore
- (B) Rs. 45 crore
- (C) Rs. 50 crore
- (D) Rs. 55 crore
- (E) Rs. 66.66 crore

195. Which company had the highest profit percentage in the year 2014?

- (A) A
- (B) B
- (C) C
- (D) D
- (E) A and D

196. A student took a test in which 3 marks were given for each correct answer and 0.5 marks were deducted for an incorrect answer. If the test had 25 questions and the student attempted all the questions and got 40 marks in total, what is the difference between the number of correct and incorrect answers?

- (A) 5
- (B) 10
- (C) 12
- (D) 15
- (E) 18

197. In an exam that was taken by 75 students, 40 passed in mathematics, 50 in science, while 10 failed in both the subjects. Find the percentage of people who passed in both the subjects.

- (A) 25%
- (B) 33.33%
- (C) 40%
- (D) 45%
- (E) 50%

198. What was the day on 1<sup>st</sup> January 2001?

- (A) Thursday
- (B) Wednesday
- (C) Monday
- (D) Tuesday
- (E) Friday

199. A group of friends contributed to the cost of a party where each person had to contribute the same integer amount. Since three people did not participate, the remaining people had to pay Rs. 10 more. If the total amount contributed is the minimum value possible, what would be the per person contribution had 10 people contributed to the party?

- (A) Rs. 2
- (B) Rs. 5
- (C) Rs. 6
- (D) Rs. 8
- (E) Rs. 10

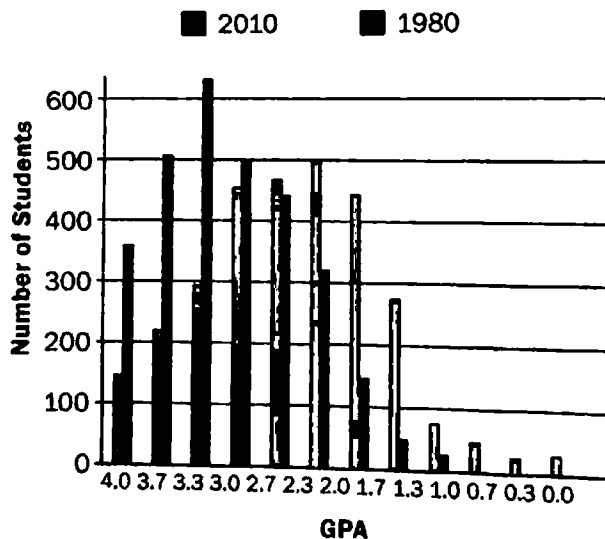
200. Find the slope of line AB that is perpendicular to the line EF whose equation is  $4y + 12x = 48$ .

(A)  $\frac{2}{3}$   
(B)  $\frac{1}{3}$   
(C) 3  
(D) -3  
(E)  $-\frac{1}{3}$

201. What is the total surface area of a cone where slant height  $l$  is 13 cm and the radius of the base is 5 cm?

(A) 162.85  
(B) 196  
(C) 282.85  
(D) 296  
(E) 340.85

Directions for Questions 202–205: Refer to the following graph and answer the questions.



Comparison of GPAs of 3000 students in 1980 and in 2010

202. What was the mode for the GPA among the 3,000 students in 2010?

(A) 3.7  
(B) 3.3  
(C) 3.0  
(D) 2.7  
(E) 2.3

203. What was the median GPA among the 3,000 students in 1980?

(A) 3.7

(B) 3.3  
(C) 3.0  
(D) 2.7  
(E) 2.3

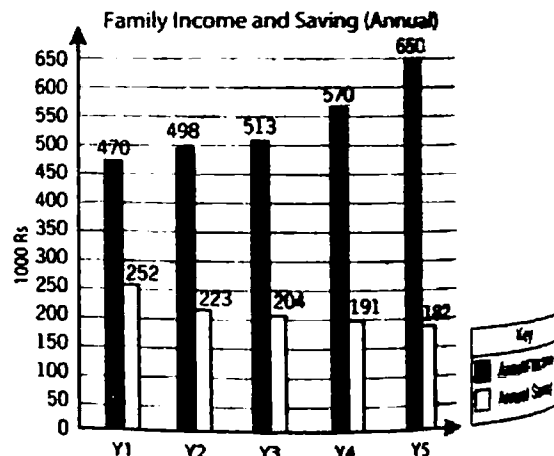
204. Approximately what percentage of the students in 2010 earned at least a 3.0 GPA?

(A) 25%  
(B) 50%  
(C) 67%  
(D) 80%  
(E) 97.5%

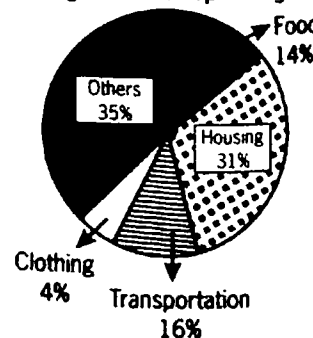
205. Approximately what percentage of the students in 1980 earned a GPA less than 3.0?

(A) 33%  
(B) 37.5%  
(C) 50%  
(D) 62.5%  
(E) 75%

Directions for Questions 206–209: Go through the pie graphs and solve the questions based on them.  
(Real NMAT Question)



Average Annual Spending Breakup



206. The annual family spending in the year preceding 2006 was Rs. 1,50,000. Which year recorded the lowest percentage increase in the annual family spending over the preceding year?

- (A) Y1  
(B) Y2  
(C) Y3  
(D) Y4  
(E) Y5
207. What was the total increase in the amount of money the family spent annually on buying food and clothing in Y2 over Y1?  
(A) Rs. 10,260  
(B) Rs. 20,520  
(C) Rs. 28,980  
(D) Rs. 39,240  
(E) Rs. 49,500
208. In which year did the family spend a total of exactly Rs. 60,640 on transportation?  
(A) Y1  
(B) Y2  
(C) Y3  
(D) Y4  
(E) Y5
209. On which item did the family spend between Rs. 1 lakh and Rs. 1.2 lakh annually in Y4?  
(A) Food  
(B) Housing  
(C) Transportation  
(D) Clothing  
(E) Other
210. Find the sum to infinite terms of the series  $\frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \dots$   
(A)  $\frac{1}{2}$   
(B)  $\frac{1}{3}$   
(C)  $\frac{1}{4}$   
(D)  $\frac{1}{6}$   
(E)  $\frac{1}{8}$
211. Which term of the AP series 3, 8, 13, ... is the term 78?
- (A) 14  
(B) 15  
(C) 16  
(D) 17  
(E) 18
212. Find the ninth term of an AP whose first term is 5 and common difference is 4.  
(A) 35  
(B) 37  
(C) 41  
(D) 43  
(E) 47
213. In an exam where 175 students appeared, 140 passed in physics, 150 in biology while 10 failed in both the subjects. Find the percentage of people who passed in both the subjects.  
(A) 68.71%  
(B) 71.42%  
(C) 74.56 %  
(D) 78.54%  
(E) 81.76%
- Direction for Questions 214-215:** Each data sufficiency problem consists of a question and two statements, labelled (1) and (2), which contain certain data. Using these data and your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of the word counterclockwise), decide whether the data given are sufficient for answering the question and then indicate one of the following answer choices:
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient.
214. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.  
**(Real NMAT Question)**  
What is the value of  $Q$ ?  
(1) Ratio of  $P$  and  $Q$  is 3:5, where  $P$  is positive.  
(2) Ratio of  $P$  and  $Q$  is  $\frac{6}{20}$ , where  $Q$  is positive.



215. What percentage of a group of people are men with MBA degrees?

- (1) Of all the men in the group, 25% have MBA degrees.
- (2) Of all the women in the group, 30% have MBA degrees.

216. Priya deposited Rs. 20,000 on 1st January 2014 to open a savings account. She withdrew Rs. 1,000 on the 10th of every month. She closed her account on 6th June 2014. If the bank pays interest at 4% p.a, then approximately how much interest did she receive on closing the account?

(Real NMAT Question)

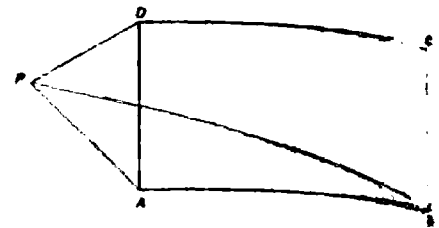
- (A) Rs. 192
- (B) Rs. 283
- (C) Rs. 296
- (D) Rs. 384
- (E) Rs. 420

217. In a classroom, one student is to be selected at random to solve a question. What is the probability that a girl will be selected?

- (1) Two-fifths of the students in the classroom are boys.
- (2) 15 of the students in the classroom are boys.

- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

218. In the figure ABCD is a rectangle. If  $AP = 4$  cm,  $DP = 3$  cm and  $BP = 9$  cm, what is the length of CP? (Real NMAT Question)



- (A) 7 cm
- (B) 8 cm
- (C)  $\sqrt{74}$  cm
- (D)  $\sqrt{84}$  cm
- (E)  $\sqrt{91}$  cm

219. In the xy-coordinate plane, line  $L$  is perpendicular to the y-axis and passes through the point  $(8, -4)$ . Which of the following is an equation of the line?

- (A)  $x = -4$
- (B)  $x = 8$
- (C)  $y = -8$
- (D)  $y = -4$
- (E)  $y - 4 = x + 8$

220. A number when used to divide 1,691, 2,171 and 2,651 leaves the same remainder in each case for the largest such number. (Real NMAT Question)

- (A) 240
- (B) 360
- (C) 480
- (D) 720
- (E) 960

**Directions for Questions 221–223:** The table below shows the incomplete data for the sale of confectionery in the Selaqui market in the year 2012–2013. The data are shown for two brands called A and B and the total market. The other brands in the market other than A and B have been classified as 'Others'. All the questions are related to this data only. The growth rate indicated in the table is the growth rate in sales on value basis. Assume that the number of confectioneries in the Selaqui market is the same in all the years mentioned.

Details	2012			2013		
	A	B	Total market	A	B	Total market
Sales in Rs.		40,000		60,000		
Market share		25%			33.33%	
Growth rate	66.66%		25%	25%		20%

221. If all the 'Other' brands had a total sale of Rs. 48,000 in the year 2011, what is the market share of company B in the year 2011?

(A) 20%  
(B) 24%  
(C) 32%  
(D) 40%  
(E) Cannot be determined

222. What was the market share of brand A in the year 2012?

(A) 20%  
(B) 22.5%  
(C) 28%  
(D) 30%  
(E) Cannot be determined

223. If there were no new entrants and all the existing brands grew by 5% in 2014 as compared to the previous year, find the total value of the confectionery market in Selaqui in the year 2014.

(A) 1,96,600  
(B) 1,97,900  
(C) 2,00,000  
(D) 2,01,600  
(E) None of these

224. Find the total surface area of an ice cream which is in the form of a hemisphere mounted on a cone of radius 19 mm. The total height of the ice cream is 199 mm. (Real NMAT Question)

(A)  $3,610\pi$  sq mm  
(B)  $3,781\pi$  sq mm  
(C)  $4,161\pi$  sq mm  
(D)  $11,872\pi$  sq mm  
(E)  $15,124\pi$  sq mm

225. Jasmine has a collection of 1 rupee, 50 paise and 25 paise coins kept in a jar. If the number of 1 rupee, 50 paise and 25 paise coins are in the ratio of 5 : 6 : 8 and makes a sum of Rs. 210, how many one rupee coins does she have?

(Real NMAT Question)

(A) 42  
(B) 63  
(C) 100  
(D) 105  
(E) 126

**Directions for Questions 226–228:** In a newly launched video game 'Shoot At Sight', each player is supposed to shoot at targets on the screen. For each hit, the score of the player is doubled while for each miss, the score is halved. Each player is given 10 shots at the targets. Each player starts with 100 points in his account initially. The game is over as soon as a player uses all the 10 shots. Two friends, Jai and Viru, played the game and finished with total of 6,400 and 1,600 points respectively.

226. If Jai did not hit the target more than three times consecutively at any time, then which of the following cannot be the shot which he missed?

(Real NMAT Question)

(A) 3<sup>rd</sup> shot  
(B) 4<sup>th</sup> shot  
(C) 6<sup>th</sup> shot  
(D) 7<sup>th</sup> shot  
(E) 8<sup>th</sup> shot

227. Which of the following cannot be the total points of Viru, after taking his 6<sup>th</sup> shot at the target?

(Real NMAT Question)

(A) 100  
(B) 200  
(C) 400  
(D) 1,600  
(E) 6,400

228. If all the missed shots of both Jai and Viru came within the first 5 shots they took individually, then which of the following cannot be the sum of their total points after they took their 4<sup>th</sup> shot each?

(Real NMAT Question)

(A) 125  
(B) 200  
(C) 325  
(D) 425  
(E) 500

229. When 10 grams of sugar is added to 225 grams of a brand of sweetened cornflakes, the resulting mixture is 10% sugar. What was the percentage of sugar in the 225 grams of cornflakes?

(Real NMAT Question)

(A) 5.6%  
(B) 5.7%  
(C) 6%  
(D) 6.4%  
(E) 10%

230. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.  
(Real NMAT Question)

Ramu and Somu were born into a family who had worked in the textile business for generations. While their ancestors believed that a zero clash of professional interests could be ensured only by family members taking up different segments of the textile business, the two brothers felt that if they both worked on the same segment, complementing each other but engaging in healthy competition, it would bring about brighter business prospects. Both of them stocked and sold the same merchandise and often bought textile goods from the same source, though not necessarily on the same terms and conditions.

The two brothers decided to enter a strategic price war by offering discounts on a piece of dress material which was not selling well.

Whose customer, Ramu's or Somu's, got a better deal?

- (1) Somu offered 20% discount and on further demand from the customer, gave him a cash discount of Rs. 1,000.
  - (2) Ramu's cash discount of Rs. 1,000 did not attract customers. So he announced an additional 20% discount.
- (A) Statement (1) ALONE is sufficient, but Statement (2) is not sufficient.  
(B) Statement (2) ALONE is sufficient, but Statement (1) is not sufficient.  
(C) BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient, and additional data is needed.

**Directions for Questions 231–234:** Below is the information about number of laptops (figures in 1000s) of different models produced and rejected by a company over six years.

231. In case of Type Q laptop, in which year was the ratio of rejection to production the highest among the given years?  
(A) 2010  
(B) 2011  
(C) 2012  
(D) 2014  
(E) 2015
232. In which year was the ratio of rejection to production the lowest among the given years for type T laptops?  
(A) 2010  
(B) 2012  
(C) 2013  
(D) 2014  
(E) 2015
233. What was the difference in Type R laptops rejected between 2011 and 2012?  
(A) 150  
(B) 200  
(C) 250  
(D) 2000  
(E) 2400
234. The acceptable (not rejected) Type T laptops in 2012 were what percentage of those in 2011?  
(A) 8  
(B) 14  
(C) 106  
(D) 108  
(E) 110

Number of laptops of different models produced and rejected by a company over the years (figures in 1000s)

Laptop model	P		Q		R		S		T	
Year	Produced	Rejected	Produced	Rejected	Produced	Rejected	Produced	Rejected	Produced	Rejected
2010	20	2	50	3	15	0.5	80	5	60	4
2011	35	3	45	2	20	0.55	75	4	58	3.5
2012	15	0.5	40	2.5	17	0.7	58	2	62	1.5
2013	25	0.25	42	2.3	25	1.5	65	3	40	2
2014	30	1.5	48	2.5	30	2	68	3	45	2.5
2015	27	1.5	41	2.1	26	1.75	72	3.5	50	2.3

235. Sheila borrowed Rs. 6,240 from Shyam on September 1 and promised to repay it by the end of the month. Shyam put forth a condition that Sheila should repay an amount each day and that the difference between the amounts paid in any two consecutive days should be Rs. 10, i.e. the amount to be paid on a particular day (except the first day) should be Rs. 10 more than the amount paid on the previous day. How much did she pay Shyam on September 1? (*Real NMAT Question*)

(A) Rs. 10  
(B) Rs. 38  
(C) Rs. 39  
(D) Rs. 68  
(E) None of the above

236. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem. (*Real NMAT Question*)

What is the value of  $X$ ?

- (1) The absolute value of  $Y^2 - 4$  is multiplied by 3 which is equal to  $X - 2$ .  
(2) The absolute value of  $3 - X$  is equal to 11.  
(A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
(C) BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient, and additional data is needed.

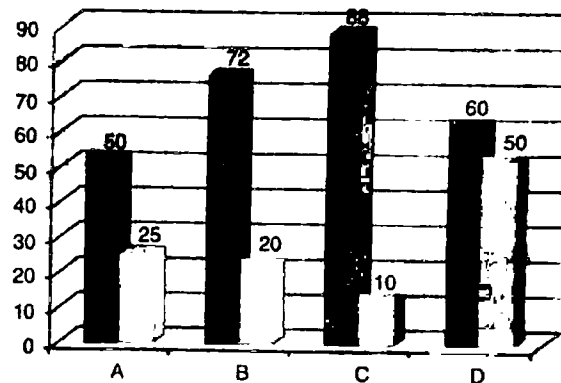
237. The following table gives the percentage breakdown of the total marks obtained by 5 students A, B, C, D and E in 6 subjects, P, Q, R, S, T and U, of their final exams. The maximum marks in each subject are 100 and every student got an integral score. (*Real NMAT Question*)

	P	Q	R	S	T	U
A	10	14	22	14	18	22
B	12	17	20	19	15	17
C	15	10	20	15	20	20
D	15	17	19	25	14	10
E	16	18	16	18	18	14

What can be the maximum possible total score achieved by any of these 5 students?

- (A) 450  
(B) 500  
(C) 550  
(D) 580  
(E) 600

**Directions for Questions 238–243:** The following bar graph depicts the details of the number of students in four different sections of PKG in Ann Mary School. While the first bar represents the number of students in that section in the current year, the second bar represents the percentage change in the number of students in that section from the previous year.



Further, it was noted that no two sections had the same number of students in any of the two years.

The number of sections that saw an increase in the number of students was the same as the number of sections where the total strength decreased.

238. What was the total strength of Section B in the previous year?  
(A) 60  
(B) 90  
(C) 80  
(D) 70  
(E) Cannot be determined
239. In the previous year, what was the ratio of the number of students in Section C to those in Section D?  
(A) 1:3  
(B) 3:1  
(C) 2:3  
(D) 2:5  
(E) None of these
240. Which among the following sections saw the least change in the number of students from the previous year?

- (A) A
- (B) B
- (C) C
- (D) D
- (E) A and C

241. If 50% of the total decrease is attributed to students shifting to other schools while the entire increase is due to new admissions, what is the difference between the number of students shifting to other schools and new admissions?

- (A) 18
- (B) 21
- (C) 26
- (D) 39
- (E) 60

242. Which two sections saw a decrease in the number of students in the current year as compared to the previous year?

- (A) B and C
- (B) A and D
- (C) B and D
- (D) A and C
- (E) A and B

243. Find the number of students in the previous year in Section D.

- (A) 40
- (B) 120
- (C) 60
- (D) 80
- (E) Cannot be determined

**Directions for Questions 244–251:** Each data sufficiency problem consists of a question and two statements, labelled (1) and (2), which contain certain data. Using these data and your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of the word *counterclockwise*), decide whether the data given are sufficient for answering the question and then indicate one of the following answer choices:

- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are not sufficient.

**Note:** In data sufficiency problems that ask for the value of a quantity, the data given in the statements is sufficient when it is possible to determine exactly one numerical value for the quantity.

244. Find the value of the number if it is less than 100.  
 (1) The number is a perfect square.  
 (2) It is a multiple of 16.

245. Is  $pq > 0$ ? (**Real NMAT Question**)

- (1)  $\left(\frac{p}{q}\right) > 0$
- (2)  $p > 0$

246. Find the speed of the stream.

- (1) A log of wood travels 4 km in 3 h.
- (2) Speed of a boat while moving downstream is 7 km/h.

247. Find the average speed of tiger 'X'. (**Real NMAT Question**)

- (1) Initially tiger 'X' covers some part of the distance at 57 m/s.
- (2) Tiger 'X' covers the remaining part of the distance at 43 m/s.

248. If  $a$  is an integer, is  $a + 1$  even?

- (1)  $a + 2$  is an even integer.
- (2)  $a - 1$  is an odd integer.

249. Who is the tallest among A, B, C, D and E?

- (1) B and C are not the tallest.
- (2) A is taller than D who in turn is taller than E.

250. If Udit saved Rs. 1200 of his earnings last month, how much did Udit earn last month?

- (1) Udit spent  $\frac{1}{2}$  of his earnings last month on household expenses and saved  $\frac{1}{4}$  of the remainder.
- (2) Of his earnings last month, Udit paid twice as much in rent as he saved.

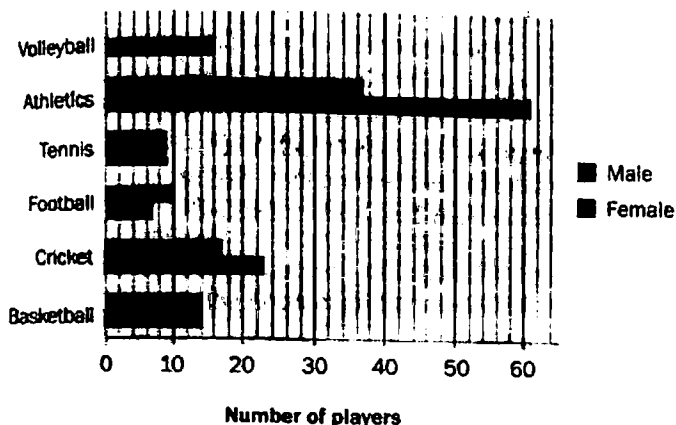
251. Water is pumped into a partially filled swimming pool at a constant rate through an inlet pipe. At the same time, water is pumped out of the pool at a constant rate through an outlet pipe. At what rate, in litres per minute, is the amount of water in the pool increasing?

- (1) The amount of water initially in the pool is 50 litres.

- (2) Water is pumped into the pool at a rate of 50 litres per minute and out of the pool at a rate of 20 litres every 4 minutes.

Directions for Questions 252-255: Go through the following graph and solve the questions based on it.

University Sports Teams



252. What is the ratio of male players to female players on the Athletics team?

(A) 37 : 61  
(B) 9 : 17  
(C) 16 : 23  
(D) 14 : 19  
(E) 61 : 37

253. All players, except those in Athletics and Cricket teams, are a part of only one team. If there are a total of 76 male players in different university sports teams, how many male players are in both Athletics team and Cricket team?

(A) 11  
(B) 17

(C) 37  
(D) 54  
(E) 76

254. In which of the following university sports team(s) do male players outnumber female players?

(A) Athletics, Tennis and Football  
(B) Cricket  
(C) Football and Cricket  
(D) Football  
(E) Tennis and Athletics

255. What is the ratio of female tennis players to male basketball players on the university sports teams?

(A) 5 : 14  
(B) 9 : 14  
(C) 7 : 18  
(D) 14 : 9  
(E) 18 : 7

Directions for Questions 256-259: The table below shows the number of male graduates, urban graduates and total graduates in some states as well as in India as a whole. Go through the given table and answer the questions based on it. (Real NMAT Question)

256. What can be the approximate number of female graduates living in rural areas of Andhra Pradesh?

(A) 39,91,398  
(B) 59,76,435  
(C) 76,52,431  
(D) 99,95,643  
(E) Data inadequate

257. What is the total population of Bihar and West Bengal?

(A) 3,15,01,163  
(B) 4,95,76,435

State	Male Graduates	Urban Graduates	Total Number of Graduates	Total Graduates As % of State Population
Andhra Pradesh	62,28,011	21,20,087	1,23,39,496	16.2
Bihar	67,84,676	8,70,053	1,30,48,608	15.7
Tamil Nadu	59,32,925	35,48,614	1,18,57,504	19.0
Uttar Pradesh	1,85,02,838	43,31,781	3,51,48,377	21.1
West Bengal	94,69,659	29,27,630	1,84,52,555	23.0
India	8,60,88,760	3,36,24,822	16,66,35,700	16.2

- (C) 7,35,97,612
- (D) 16,33,40,653
- (E) 17,96,54,762

258. What percentage of graduates in India is female?

- (A) 46.34%
- (B) 48.34%
- (C) 50.43%
- (D) 51.66%
- (E) 52.34%

259. What percentage of graduates in Tamil Nadu and Uttar Pradesh live in urban areas?

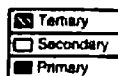
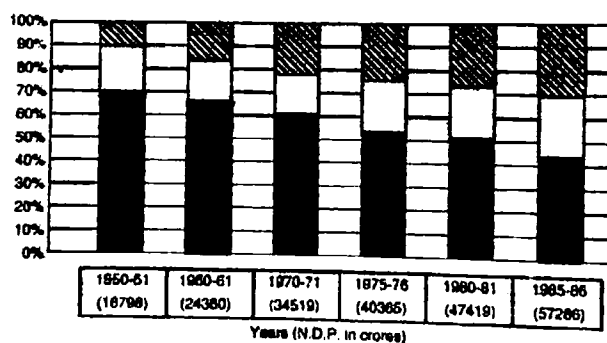
(Real NMAT Question)

- (A) 14.74%
- (B) 15.76%
- (C) 16.76%
- (D) 16.96%
- (E) 17.16%

Directions for Questions 260–263: Answer the questions on the basis of the information given below.

(Real NMAT Question)

Percentage Distribution of Domestic Produce at Factor Cost and at Constant Prices with base year 1970-71



260. What was the contribution (in billion rupees) of the primary sector to the N.D.P. in 1980-81?

- (A) 143.7
- (B) 173.6
- (C) 189.7
- (D) 237.1
- (E) 390.5

261. In which year did the contribution of the tertiary sector register the maximum percentage increase with respect to previous data given?

- (A) 1950-51
- (B) 1960-61
- (C) 1970-71

140

- (D) 1980-81
- (E) 1985-86

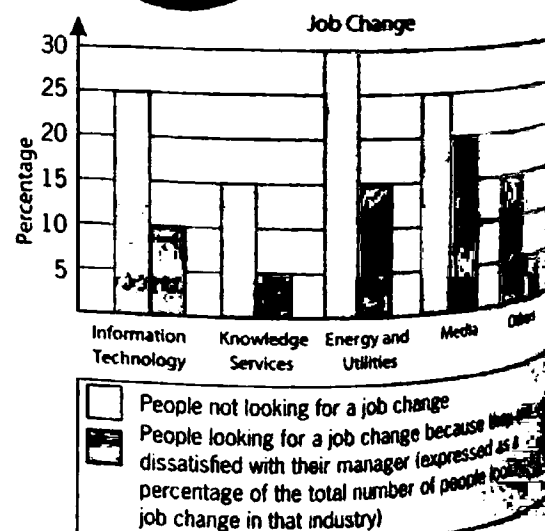
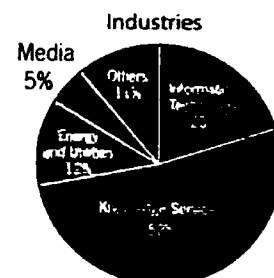
262. By approximately what percentage did the N.D.P. increase between 1960-61 and 1985-86?

- (A) 135%
- (B) 147%
- (C) 160%
- (D) 178%
- (E) 180%

263. By approximately how much (in crore rupees) did the contribution of the secondary sector to the N.D.P. increase from 1970-71 to 1980-81?

- (A) 3,800
- (B) 4,000
- (C) 4,550
- (D) 4,800
- (E) 4,950

Directions for Questions 264–267: A survey was conducted among 2,10,000 people employed in different industries. The graphs below show the results of the survey. Go through the graphs and answer the questions based on them. (Real NMAT Question)



264. Out of the total number of people in the Information Technology industry who were looking for a job change for reasons other than dissatisfaction with their manager, 34% were looking for a job change because of low salary. How many people in the

Information Technology industry were looking for a job change because of low salary?

- (A) 3,150
- (B) 4,200
- (C) 6,529
- (D) 8,350
- (E) 9,639

265. In the following year, for each industry the population remained the same, the percentage of people who were not looking for a job change increased by 5, and the percentage of people looking for a job change because of dissatisfaction with the manager remained the same. What is the approximate percentage decrease in the number of people looking for a job change because of dissatisfaction with the manager in the Knowledge Services?

- (A) 3.26%
- (B) 5.25%
- (C) 5.68%
- (D) 5.88%
- (E) 6.27%

266. Based on the graphs, what was the average number of people across all the industries who were looking for a job change?

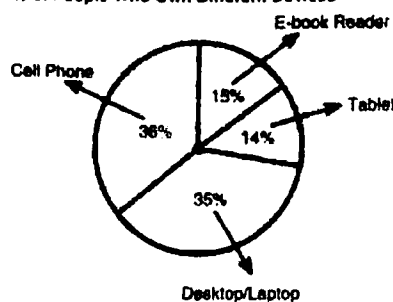
- (A) 22,820
- (B) 31,240
- (C) 33,894
- (D) 38,248
- (E) 41,209

267. Among the people surveyed in each industry who were not looking for a job change, 80% were working in the same company for less than two years. Which industry had 6,048 people who were working in the same company for less than two years?

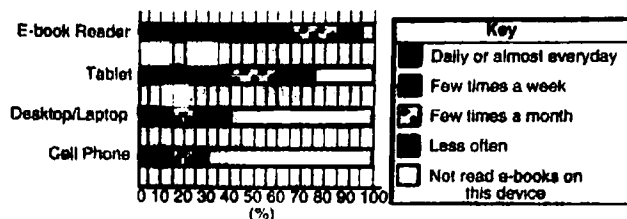
- (A) Information Technology
- (B) Knowledge Services
- (C) Energy and Utilities
- (D) Media
- (E) Others

Directions for Questions 268–271: In a survey, 21,000 people who were owners of different devices were asked how frequently they read e-books on the device they owned. Go through the given graphs and solve the question based on them. (Real NMAT Question)

% of People Who Own Different Devices



Frequency of Reading E-books on the Device Owned



268. What is the total number of cell phone and desktop/laptop owners who do not read e-books on the device they own?

- (A) 4,410
- (B) 5,292
- (C) 7,350
- (D) 7,560
- (E) 9,702

269. What is the difference between the number of owners of tablets who read e-books on the tablet daily or almost every day and the number of owners of tablets who read e-books less often on a tablet?

- (A) 294
- (B) 325
- (C) 441
- (D) 524
- (E) 735

270. Of the total number of people who read e-books a few times a month on the device they own, approximately what percentage use their tablet to read e-books a few times a month?

- (A) 21.71%
- (B) 28.48%
- (C) 32.46%
- (D) 38.64%
- (E) 45.82%

271. If  $\frac{2}{3}$  of the total number of people who read e-books less often on cell phones, e-book readers and tablets



read e-books on these three devices only once a year, how many people read e-books on these three devices only once a year?

- (A) 582
- (B) 624
- (C) 756
- (D) 1,134
- (E) 2,940

272. In a school exhibition, hand-made crafts are displayed for sale. Some students are assigned the work of selling crafts. The overall profit  $p$  depends on the number of students  $x$  selling the crafts on that particular day and is given by the equation  $p = 250x - 5x^2$ . The school manager claims to have made a maximum profit. Find the number of students engaged in selling the crafts and the maximum profit made. (Real NMAT Question)

- (A) 25 and Rs. 1,800
- (B) 25 and Rs. 2,900
- (C) 25 and Rs. 3,125
- (D) 30 and Rs. 3,900
- (E) 34 and Rs. 4,000

Directions for Questions 273–276: Refer to the following table and answer the questions that follow.

Number of trousers produced by 5 factories over 5 months of 2016.

Month	Prisma	Shelby	Kooper	Wendy	Caret
Jan	900	850	350	1000	850
Feb	800	700	1050	1100	850
Mar	1050	800	1000	1100	950
Apr	800	850	850	1100	850
May	950	900	1050	1150	850
Total	4500	4100	4900	5450	4350

273. For which factory was the number of trousers manufactured in March the highest percentage of the total number of trousers produced by that factory during the five-month period?
- (A) Prisma
  - (B) Shelby
  - (C) Kooper
  - (D) Wendy
  - (E) Caret
274. The number of trousers manufactured by Wendy in April is what percentage of the number of trousers manufactured by Wendy in January?
- (A) 10%

- (B) 91%
- (C) 110%
- (D) 115%
- (E) 125%

275. Which of the five factories has the highest ratio of number of trousers manufactured in April to number of trousers manufactured in February?

- (A) Prisma
- (B) Shelby
- (C) Kooper
- (D) Wendy
- (E) Caret

276. For which factory was the number of trousers manufactured in February and March together the lowest among the five factories?

- (A) Caret
- (B) Wendy
- (C) Kooper
- (D) Shelby
- (E) Prisma

Direction for Questions 277–281: Each question is followed by two statements, I and II. Answer the questions based on the statements and mark the answer as follows:

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

277. In how much time will the work get completed if 15 men work for 8 hours (h) every day?

- I. Twenty women working for 7 h can do the work in 12 days.
- II. Eight men working for 15 h can do the work in 18 days.

278. Radha and Rani took an examination. What was the total number of questions?

- I. Radha and Rani together solved 20% of the paper.
- II. Radha alone solved  $\frac{5}{3}$  of the paper solved by Rani.

279. What is the price of tea?

- I. The price of coffee is Rs. 5 more than that of tea.
- II. The price of coffee was Rs. 5 less than the price of a cold drink, which cost three times the price of tea.

280. Is  $n$  a positive number?

- I.  $4n > 5n$
- II.  $n + 6$  is positive.

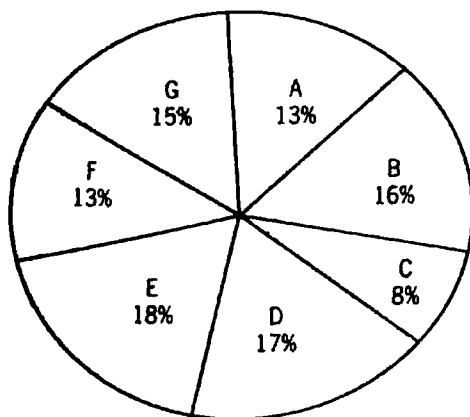
281. What is the cube root of  $y$ ?

- I. The 7th root of  $y$  is 12.
- II. The 22nd root of  $y$  is 2.

Directions for Questions 282–285: Study the following chart to answer the question given below:

Town	% of the population below the poverty line
A	45
B	52
C	38
D	58
E	46
F	49
G	51

Percentage distribution of the population of seven towns of the state in 2005.



282. In 2006, the populations of Town A and Town B each increased by 10% as compared to 2005. If the population of Town A in 2005 was 5000 and the percentage of the population living below the poverty line for all seven towns in 2006 remains the same as in 2005, which of the following is the approximate population of Town B below the poverty line in 2006?

- (A) 2500
- (B) 3000

(C) 3500

(D) 4000

(E) 4500

283. In 2007, the population of Town D increased by 10% as compared to 2005 and the population of Town G reduced by 5% as compared to 2005. If the population of Town G in 2005 was 9000, what is the total population of Towns D and G in 2007?

(A) 19200

(B) 19770

(C) 19870

(D) 19970

(E) None of the above

284. If in 2005 the total population of the seven towns together was approximately 55,000, what will be the approximate population of Town F in that year below the poverty line.

(A) 2500

(B) 3000

(C) 3500

(D) 4000

(E) 4500

285. The population of Town C is 2000 in 2005. What will be the ratio of the population of Town C below the poverty line to that of Town E below the poverty line in that year?

(A) 207 : 76

(B) 76 : 207

(C) 152 : 207

(D) 76 : 307

(E) 87 : 207

286. The average of five consecutive integers is 20. What is the average of the first 3 of these integers?

(A) 15

(B) 17

(C) 18

(D) 19

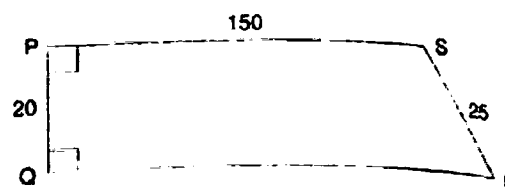
(E) 21

Direction for Questions 287–292: Each question is followed by two statements, 1 and 2. Answer the questions based on the statements and mark the answer as follows:

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.

- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.
287. In triangle ABC, if  $AB = x$  units,  $BC = x + 4$  units, and  $AC = y$  units, which of the three vertex angles of triangle ABC has the greatest degree measure?
- $y = x + 8$
  - $x = 4$
288. How many factors does the number  $N$  have?
- $N$  is the square of an odd natural number and  $N$  is less than 50.
  - $N = 2^2 \times 3^1$
289. How many students among A, B, C and D have passed the examination?
- The following statement is true: A and B passed the examination.
  - The following statement is false: At least one among C and D has passed the examination.
290. What percentage of Debating club members enrolled at a certain school are from India?
- Of the Indian students enrolled at the school, 20% are members of the Debating club.
  - Of the non-Indian students enrolled at the school, 45% are members of the Debating club.
291. If the sequence  $S$  has 150 terms, what is the 121st term of  $S$ ?
- The first term of  $S$  is 32.
  - The 138th term of  $S$  is 1248, and each term of  $S$  after the first is 18 more than the preceding term.
292. Find the value of the two-digit number.
- The sum of the digits is 11.
  - The sum of the number and its reverse is also divisible by 11.

293. In the figure given  $PS \parallel QR$ . What is the perimeter of the quadrilateral PQRS?



- (A) 320  
(B) 345  
(C) 360  
(D) 380  
(E) 400

## 3.2 Answer Explanations

The following discussion is intended to familiarise you with the most efficient and effective approaches to the kinds of problems common to quantitative skill questions. The particular questions in this chapter are generally representative of the kinds of problem-solving questions you will encounter on the NMAT exam. Remember that it is the problem-solving strategy that is important, not the specific answers or details of a particular question.

1. Manoj plans to work at a coffee shop during his summer holidays. He will be paid as per the following schedule: at the end of the first week, he will receive Rs. 1000. At the end of each subsequent week, he will receive Rs. 1000, plus an additional amount equal to the sum of all payments he has received in the previous weeks. How much money will Manoj be paid in total if he works for 6 weeks at this coffee shop?

- (A) Rs 18000  
(B) Rs. 20000  
(C) Rs. 42000  
(D) Rs. 63000  
(E) Rs. 81000

The given information can be tabulated as follows:

Week no.	Payment for the week	Cumulative payment
1	1000	1000
2	$1000 + 1000 = 2000$	$1000 + 2000 = 3000$
3	$1000 + 3000 = 4000$	$3000 + 4000 = 7000$
4	$1000 + 7000 = 8000$	$7000 + 8000 = 15000$
5	$1000 + 15000 = 16000$	$15000 + 16000 = 31000$
6	$1000 + 31000 = 32000$	$31000 + 32000 = 63000$

The correct answer is D.

2. If the number  $2546bc$  is completely divisible by 3, find the possible values of  $b + c$ .

- (A) 2  
(B) 3  
(C) 5  
(D) 13  
(E) 17

For a number to be divisible by 3, the sum of all the digits should be divisible by 3.

Now,  $2 + 5 + 4 + 6 + b + c$  should be divisible by 3.

$17 + b + c$  must be divisible by 3.

Therefore,  $b + c$  must be a (multiple of 3) + 1.

That is, 1, 4, 7, 10, 13, 16, 19.

$b + c$  can take the mentioned nine values. 13 is the only value available in the options.

The correct answer is D.

3. A number  $Q$  gives a remainder of 5 when divided by 7. Find the remainder when  $2Q$  is divided by 7.

- (A) 2  
(B) 3  
(C) 5  
(D) 7  
(E) 9

$2Q$  when divided by 7 will give a remainder of  $2 \times 5$ , that is, 10. This can be divided by 7 and the required remainder will be 3.

The other way of approaching this question is to pick a number that satisfies the criteria given in the question, that is, it should leave a remainder of 5 when divided by 7. Let us pick  $Q$  as 12. So, when  $2Q$ , that is, 24 is divided by 7, the remainder is 3, which is your answer. You can try this with any other number, such as 19, the result will remain the same.

$$\left( \frac{38}{7} = 3 \right).$$

The correct answer is B.

4. In an ancient civilisation, the measure of a foot was the size of the head of the current ruler of the civilisation. If the ruler at that time had a head that was 10-inches long, a fence that measured 600 feet at that time would today have a length of how many feet? (Today, 12 inches = 1 foot)

- (A) 300  
(B) 450  
(C) 500  
(D) 750  
(E) 800

Total number of inches in the fence =  $600 \times 10 = 6000$

Thus, in modern times  $6000 \text{ inches} = \frac{6000}{12} \text{ foot} = 500 \text{ feet}$

The correct answer is C.

5. Almonds at Rs. 3 per pound are mixed with peanuts at Rs. 5 per pound. If the total weight of the mixture is 10 lbs and the average cost is Rs. 4.8 per pound, how many pounds of peanuts are there in the mixture? (*Real NMAT Question*)

(A) 5  
(B) 6  
(C) 7  
(D) 8  
(E) 9

Let the quantity of almonds in the mixture be  $x$ .

Then the quantity of peanuts =  $10 - x$

As per the question,

$$\frac{3x + 5(10 - x)}{10} = 4.8$$

$$\text{or, } 3x + 50 - 5x = 48$$

$$\text{or, } 2x = 50 - 48$$

$$\text{or, } x = \frac{2}{2} = 1$$

So the quantity of peanuts in the mixture =  $10 - x = 10 - 1 = 9$  pounds

The correct answer is E.

6. In an election between two candidates, a candidate got 55% of the votes polled and won by a margin of 80 votes. In the next election, the number of votes received by the candidate increased by 20%. Still, the candidate lost the election by a margin of 40 votes. What is the increase in the number of votes polled?

(A) 296  
(B) 306  
(C) 528  
(D) 568  
(E) 1,096

In the first case, the difference between 55% and the remaining 45% of the votes is 80.

This would mean 10% of the votes is 80, and so the total number of votes initially is 800.

55% of 800 is 440 votes. This value is increased by 20% in the next election. Now, 20% of 440 is 88 votes, and so the votes received by the candidate in the next election was =  $440 + 88 = 528$  votes.

The number of votes received by the other candidate =  $528 + 40 = 568$  votes.

Total votes =  $528 + 568 = 1,096$  votes.

Increase in the number of votes polled =  $1,096 - 800 = 296$  votes.

The correct answer is A.

7. Manish has 60 marbles that he wants to divide among himself and his 12 friends. The marbles don't necessarily have to be divided equally. If Manish wants to have more marbles than any of his friends, what is the least number of marbles he can have?

(A) 5  
(B) 6  
(C) 7  
(D) 8  
(E) 12

The simplest way to approach this question is to divide the marbles evenly among all 13 people and then adjust this number so that Manish ends up with the most marbles.

$$\frac{60}{13} = 4.61$$

Let Manish have 5 marbles. Then each of his friends can have at the most 4 marbles, giving a total of  $(12 \times 4) + 5 = 53$  marbles. We still have 7 marbles left, so Manish may not necessarily end up with the most number of marbles.

Then, let Manish have 6 marbles. Now each of his friends can have at the most 5 marbles, giving a total of  $(12 \times 5) + 6 = 66$  marbles. But we only have a total of 60 marbles, so if Manish keeps 6, there is no way any of his friends can end up with a greater number of marbles. Thus, the answer is 6.

The correct answer is B.

8. If  $3x^3 - 7 = 185$ , what is  $x^2 - x$ ?

(A) -4  
(B) 8  
(C) 12  
(D) 16  
(E) 27

$$3x^3 - 7 = 185$$

$$\text{or, } 3x^3 = 192$$

$$\text{or, } x^3 = \frac{192}{3} = 64$$

$$\text{Thus } x = \sqrt[3]{64} = 4$$

$$\text{Thus, } x^2 - x = 16 - 4 = 12$$

The correct answer is C.

9. If the product of the first hundred multiples of 5 yields a particular number, then what exact power of 125 will make the number exactly divisible? (*Real NMAT Question*)

(A) 34  
(B) 40

- (C) 48  
(D) 68  
(E) 80

First hundred multiples of 5 are 5, 10, 15, 20, — 500.

Product of first hundred multiples of

$$\begin{aligned} 5 &= 5 \times 10 \times 15 \times 20 \times \dots \times 500 \\ &= 5 \times (5 \times 2) \times (5 \times 3) \times (5 \times 4) \times \dots \times (5 \times 100) \\ &= 5^{100} \times (1 \times 2 \times 3 \times 4 \times \dots \times 100) \end{aligned}$$

In the product,  $(1 \times 2 \times 3 \times 4 \times \dots \times 100)$ , every 5<sup>th</sup> term will be a multiple of 5 and every 25<sup>th</sup> term will be a multiple of 5<sup>2</sup>.

So, the highest power of 5 contained in this product

$$\frac{100}{5} + \frac{100}{25} = 20 + 4 = 24$$

Highest power of 5 contained in the product of first hundred multiples of 5 =  $100 + 20 + 4 = 124$

Therefore, exact power of 125 ( $= 5^3$ ) that will make

$$\text{the product exactly divisible} = \frac{124}{3} = 41.33$$

Therefore, from the options, the closest answer is

40.

**The correct answer is B.**

10. If  $a^2 - b^2 = 0$  and  $ab \neq 0$ , which of the following must be true? Indicate all such statements.

1.  $a = b$   
2.  $|a| = |b|$   
3.  $\frac{a^2}{b^2} = 1$

- (A) 1 only  
(B) 2 only  
(C) 3 only  
(D) 1 and 2 only  
(E) 2 and 3 only

$a^2 - b^2 = 0$  can be rewritten as  $a^2 = b^2$ .

From here, it might look as though  $a = b$ , but this is not necessarily the case. For example,  $a$  could be 3 and  $b$  could be -3. Algebraically, when you square root both sides of  $a^2 = b^2$ , you do NOT get  $a = b$ , but rather  $|a| = |b|$ . Thus, statement 1 is not necessarily true and statement 2 is true.

Statement 3 is also true:

$$a^2 - b^2 = 0$$

$$\text{or, } a^2 = b^2$$

$$\text{or, } \frac{a^2}{b^2} = 1$$

**The correct answer is E.**

11. If  $(x - y) = \sqrt{20}$  and  $(x + y) = \sqrt{12}$  what is the value of  $x^2 - y^2$ ?

- (A)  $2\sqrt{15}$   
(B)  $4\sqrt{15}$   
(C)  $3\sqrt{20}$   
(D)  $6\sqrt{12}$   
(E)  $2\sqrt{21}$

Remember the algebraic identity

$$x^2 - y^2 = (x + y)(x - y)$$

$$\text{Then, } x^2 - y^2 = \sqrt{12} \times \sqrt{20}$$

$$= \sqrt{240}$$

$$= \sqrt{16} \times \sqrt{15}$$

$$= 4\sqrt{15}$$

**The correct answer is B.**

12. Ram opened a savings account with a bank on 1<sup>st</sup> February 2010 with a certain amount. Interest is calculated every month on simple interest basis and credited to his account at the end of June and December every year, and the rate of interest is 5% per annum. If the sum of the minimum balance is Rs. 2,000 at the end of June 2010, then what is the interest that he gets at the end of June 2010? **(Real NMAT Question)**

- (A) Rs. 8.01  
(B) Rs. 8.20  
(C) Rs. 8.33  
(D) Rs. 8.40  
(E) None of the above

Here,  $P = 2,000$

$R = 5\%$

$$T = 1 \text{ month} = \frac{1}{12} \text{ year}$$

$$\text{Simple Interest} = \frac{P \times R \times T}{100} = \frac{2,000 \times 5 \times 1}{100 \times 12} = \text{Rs. } 8.33$$

**The correct answer is C.**

13. The average price of three items is Rs. 7,000. The price of the costliest item is Rs. 900 more than the combined price of the other two. Find the price of the

costliest item as a percentage of the total cost of the three items.

- (A) 46%
- (B) 48%
- (C) 50%
- (D) 52%
- (E) 54%

As per the problem:

The average price of the three items = Rs. 7,000

Therefore, total price = Rs. 7,000  $\times$  3 = Rs. 21,000

Let the combined price of the other two items be Rs. X.

Therefore,

$$X + X + 900 = 21000$$

$$2X = 20100 \Rightarrow X = \text{Rs. } 10,050$$

Therefore, price of costliest item = 10,050 + 900 = 10,950

So, the desired percentage

$$= \frac{10,950}{21,000} \times 100 = 52.14\%$$

**The correct answer is D.**

14. What is the smallest integer which is greater than 1 and which leaves a remainder of 2 when divided by any of the integers 3, 5 and 7?

- (A) 18
- (B) 38
- (C) 105
- (D) 107
- (E) 213

You start by finding out the smallest number that is divisible by 2, 5 and 7 (which will be their LCM) and add 2 to the result.

The LCM of 3, 5 and 7 is 105, so our desired answer is 105 + 2 = 107.

**The correct answer is D.**

15. The sum of the ages of the five members in a family is 124 years. If the age of the children is in the ratio 3:4:5 while the combined age of their parents is 76, find the age of the youngest child.

- (A) 8
- (B) 12
- (C) 13
- (D) 14

- (E) 15

Combined age of the three children = 124 - 76 = 48 years

Age of the youngest child will be

$$\frac{3}{12} \times 48 = 12 \text{ years}$$

**The correct answer is B.**

16. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.  
**(Real NMAT Question)**

Is  $z = 2$  and  $x = 9$ ?

(1)  $y\sqrt{x} = -3$

(2)  $y^2z = 2$

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

From statement (1), we have

$$y\sqrt{x} = -3$$

Squaring both sides, we get

$$y^2x = 9$$

This information alone is not sufficient to calculate the value of  $z$  and  $x$ .

From statement (2), we have

$$y^2z = 2$$

This information alone is not sufficient to calculate the value of  $z$  and  $x$ .

Now, dividing equation (2) by equation (1), we get

$$\frac{y^2z}{y^2x} = \frac{z}{x} = \frac{2}{9}$$

Thus, even if we combine the information from both the statements, we are not able to calculate the values of  $x$  and  $z$ .

The correct answer is E.

17. If  $x$  is an odd number, which of the following must be even?

(A)  $x^2$   
 (B)  $x^2 + 2$   
 (C)  $\frac{(x+1)}{2}$   
 (D)  $2x + 1$   
 (E)  $2x + 2$

Note that the question says 'must be even', so there cannot be any exceptions. We know that any number multiplied by an even number gives an even product, and also the sum of two even numbers is an even number. Thus, option (E) should be our answer.

A lot of you who tried to solve this question by picking an odd number and plugging it into the answer choices might have marked (C) as the answer. But 5 is also an odd number; try plugging 5 in option (C) and see what happens.

The correct answer is E.

18. In which of the following cases can the area of a rhombus be uniquely identified?

(Real NMAT Question)

Case (I) Side = 4 cm

Case (II) Side = 4 units; one diagonal = 3 units

Case (III) Two diagonals are of lengths 5 units<sup>1</sup> and 7 units

(A) Cases (I) and (II)  
 (B) Cases (II) and (III)  
 (C) Cases (I) and (III)  
 (D) Cases (I), (II) and (III)  
 (E) None of the cases

Case (I): We cannot find the area of a rhombus uniquely as it depends on the diagonal.

Case (II): Since the diagonals of a rhombus are perpendicular bisectors, we can find the length of the other diagonal if we know one diagonal and side.

Area of a rhombus =  $\frac{1}{2} \times d_1 \times d_2$ .

Case (III): We can easily find the area of the rhombus.

The correct answer is B.

19. If  $ab \neq 0$ ,  $\frac{a^8 - b^8}{(a^4 + b^4)(a^2 + b^2)} =$

(A) 1  
 (B)  $a - b$   
 (C)  $(a + b)(a - b)$   
 (D)  $(a^2 + b^2)(a^2 - b^2)$   
 (E)  $\frac{a - b}{a + b} 2\sqrt{2}$

We know that  $x^2 - y^2 = (x + y)(x - y)$

$a^8$  can be written as  $(a^4)^2$

$a^4$  can be written as  $(a^2)^2$

The given expression can now be solved as follows:

$$\frac{a^8 - b^8}{(a^4 + b^4)(a^2 + b^2)} = \frac{(a^4 - b^4)(a^4 + b^4)}{(a^4 + b^4)(a^2 + b^2)} = \frac{a^4 - b^4}{a^2 + b^2}$$

Now, factor  $a^4 - b^4$  according to the same pattern:

$$\frac{a^4 - b^4}{a^2 + b^2} = \frac{(a^2 - b^2)(a^2 + b^2)}{(a^2 + b^2)} = a^2 - b^2$$

$$= (a + b)(a - b)$$

The correct answer is C.

20. The sum of a two-digit number and the number obtained by reversing the digits is a multiple of 88. If the difference of the digits at the ten's place and unit's place is 6, find the digit at the ten's place of the number.

(A) 1  
 (B) 3  
 (C) 5  
 (D) 6  
 (E) 7

Let the two-digit number be  $10x + y$  and so the number obtained by reversing the digits is  $10y + x$ .

Their sum will be  $11x + 11y$ , that is,  $11(x + y)$ .

If  $11(x + y)$  is a multiple of 88, then  $x + y$  is a multiple of 8, that is,  $x + y$  can be either 8 or 16.

Also,  $y - x = 6$

Thus, one possible result is  $y = 7$  and  $x = 1$ . The other result is  $y = 11$  and  $x = 5$ , which is not possible.

The correct answer is E.



21. In a business, Gita and Sita invested in the ratio of 4:5. The ratio of their income is 1:2 if Sita's salary is also included. At the end of the year, they earned a profit of Rs. 72,000. Find Sita's salary.  
**(Real NMAT Question)**

- (A) Rs. 15,000  
(B) Rs. 16,000  
(C) Rs. 17,000  
(D) Rs. 18,000  
(E) Rs. 19,000

Ratio of capitals of Gita and Sita = 4 : 5

Total profit = Rs. 72,000

Let Sita's salary be  $x$ .

Therefore, distributable profit = Rs. 72,000 -  $x$

Gita's income = Her profit share =  $\frac{4}{9} \times (72,000 - x)$

Sita's income = Her profit share + Her salary

$$\frac{5}{9} \times (72,000 - x) + x$$

Ratio of incomes = 1 : 2 (if Sita's salary is also included)

Therefore,

$$\frac{4}{9} \times (72,000 - x) : \frac{5}{9} \times (72,000 - x) + x = 1 : 2$$

$$\frac{8}{9} \times (72,000 - x) = \frac{5}{9} \times (72,000 - x) + x$$

$$64,000 - \frac{8}{9}x = 40,000 - \frac{5}{9}x + x$$

$$\frac{8}{9}x - \frac{5}{9}x + x = 24,000$$

$$\frac{12}{9}x = 24,000$$

$x = 18,000$ , which is Sita's salary.

**The correct answer is D.**

22. Two trains start from A and B and move towards B and A, respectively. The train from A starts at 6 a.m. and reaches B at 2 p.m., whereas the train from B starts at 8 a.m. and reaches A at 2 p.m. In how much time after 8 a.m. will the two trains meet?

- (A)  $1\frac{8}{9}$  h  
(B)  $\frac{15}{7}$  h  
(C)  $2\frac{1}{6}$  h

(D)  $2\frac{4}{7}$  h

(E)  $3\frac{1}{6}$  h

**Note:** Set as mixed fractions as currently done. In this example, the starting time for the two trains is different. Also, the time taken for travelling the same distance is different, which in turn would mean that their speeds are different.

Train from A starts at 6 a.m. and reaches B at 2 p.m., that is, a total travel time of 8 h.

Train from B starts at 8 a.m. and reaches A at 2 p.m., that is, a total travel time of 6 h.

Let the total distance be 24 km, and so the speed of the two trains will be 3 km/h and 4 km/h, respectively.

First, we need to make their reference starting time same, that is, we will calculate the distance travelled by the train from A for 2 h (that is from 6 a.m. to 8 a.m.).

Distance covered by the train from A in the first 2 h =  $2 \times 3 = 6$  km.

Distance between the two trains at 8 a.m. =  $24 - 6 = 18$  km.

Relative speed =  $3 + 4 = 7$  km/h.

Time taken to meet after 8 a.m. =  $\frac{18}{7} = 2\frac{4}{7}$  h

**The correct answer is D.**

23. Which of the following is equal to  $(a - 2)^2 + (a - 1)^2 + a^2 + (a + 1)^2 + (a + 2)^2$ ?

- (A)  $5a^2$   
(B)  $5a^2 + 10$   
(C)  $a^2 + 10$   
(D)  $5a^2 + 6a + 10$   
(E)  $5a^2 - 6a + 10$

We know that  $(a - b)^2 = a^2 - 2ab + b^2$  and  $(a + b)^2 = a^2 + 2ab + b^2$

Then,

$$\begin{aligned} (a - 2)^2 + (a - 1)^2 + a^2 + (a + 1)^2 + (a + 2)^2 &= (a^2 - 4a + 4) + (a^2 - 2a + 1) + a^2 + (a^2 + 2a + 1) + (a^2 + 4a + 4) \\ &= (a^2 + 4) + (a^2 + 1) + a^2 + (a^2 + 1) + (a^2 + 4) \\ &= 5a^2 + 10 \end{aligned}$$

**The correct answer is B.**

24. How much tea selling at Rs. 10.40 per kg should be mixed with tea selling at Rs. 8.80 per kg to get a resulting mixture of 15 kg for Rs. 146.40?  
(Real NMAT Question)

(A) 6 kg  
(B) 7 kg  
(C) 8 kg  
(D) 9 kg  
(E) 10 kg

Let the quantity of tea costing 10.40 in the mixture be  $x$

Then the quantity of tea costing 8.80 =  $15 - x$

According to the question,

$$10.40x + 8.80(15 - x) = 146.40$$

$$\text{or, } 10.40x + 132 - 8.80x = 146.40$$

$$\text{or, } 1.6x = 14.40$$

$$\text{or, } x = \frac{14.40}{1.6} = 9 \text{ kg}$$

The correct answer is D.

25. Pipe 1 can normally fill a tank alone in 40 days but takes 20 days more due to a leak. In how much time can the leak alone empty half the tank?

(A) 25  
(B) 35  
(C) 55  
(D) 60  
(E) 70

Let the total work be 120 units.

Pipe 1: 40 days 3 units/day

Pipe 1 + leak: 60 days 2 units/day

That is, the leak can empty 1 unit/day.

Therefore, half the tank, that is, 60 units, will get emptied in 60 days.

The correct answer is D.

26.  $a$  is inversely proportional to  $b$ . Also, it is given that  $a = 24$  when  $b = 2$ . What is the value of  $b$  when  $a = 6$ ?

(A) -2  
(B) -1  
(C) 2  
(D) 4  
(E) 8

The phrase "inversely proportional" means that  $a = k/b$  or  $ab = k$ , where  $k$  is a constant.

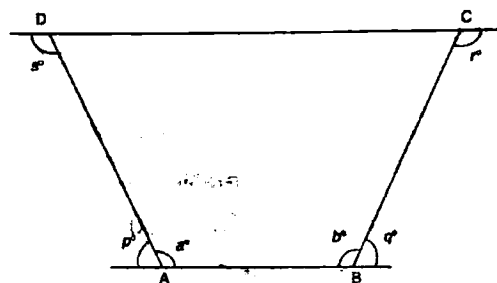
As the product of  $a$  and  $b$  is always constant, we have:

$$24 \times 2 = 6 \times b,$$

$$\text{or } b = 8.$$

The correct answer is E.

27. In the given quadrilateral ABCD,  $p^\circ + q^\circ = 100^\circ$ ,  $a^\circ = 140^\circ$  and  $r^\circ = \frac{1}{2}(a^\circ + q^\circ)$ . Find the value of angle  $s^\circ$ .  
(Real NMAT Question)



(A)  $120^\circ$   
(B)  $130^\circ$   
(C)  $140^\circ$   
(D)  $150^\circ$   
(E)  $160^\circ$

In the given quadrilateral ABCD,

$$p^\circ + a^\circ = 180^\circ \text{ (Linear Pair)}$$

Putting  $a^\circ = 140^\circ$  (given) in above equation, we get

$$p^\circ + 140^\circ = 180^\circ$$

$$p^\circ = 180^\circ - 140^\circ = 40^\circ$$

Now,  $p^\circ + q^\circ = 100^\circ$  (given),

Putting  $p^\circ = 40^\circ$  in above equation, we get

$$40^\circ + q^\circ = 100^\circ$$

Therefore,  $q^\circ = 100^\circ - 40^\circ = 60^\circ$

$$b^\circ + q^\circ = 180^\circ \text{ (Linear Pair)}$$

Putting  $q^\circ = 60^\circ$  in above equation, we get

$$b^\circ + 60^\circ = 180^\circ$$

Therefore,  $b^\circ = 180^\circ - 60^\circ = 120^\circ$

$$\text{Also, } r^\circ = \frac{1}{2}(a^\circ + q^\circ)$$

Putting  $a^\circ = 140^\circ$  and  $q^\circ = 60^\circ$  in above equation, we get

$$r^\circ = \frac{1}{2}(140^\circ + 60^\circ) = \frac{1}{2} \times 200 = 100^\circ$$

Now,  $r^\circ + \angle BCD = 180^\circ$  (Linear Pair)

Putting  $r^\circ = 100^\circ$  in above equation, we get

$$100^\circ + \angle BCD = 180^\circ$$

Therefore,  $\angle BCD = 180^\circ - 100^\circ = 80^\circ$

Now,  $a^\circ + b^\circ + \angle BCD + \angle CDA = 360^\circ$  (Sum of all the angles of a quadrilateral is  $360^\circ$ .)

$$\begin{aligned}\angle CDA &= 360^\circ - (a^\circ + b^\circ + \angle BCD) \\ &= 360^\circ - (140^\circ + 120^\circ + 80^\circ) \\ &= 360^\circ - 340^\circ\end{aligned}$$

Therefore,  $\angle CDA = 20^\circ$

Now,

$$s^\circ + \angle CDA = 180^\circ \text{ (Linear Pair)}$$

Putting  $\angle CDA = 20^\circ$  in above equation, we get

$$s^\circ + 20^\circ = 180^\circ$$

Therefore,  $s^\circ = 180^\circ - 20^\circ = 160^\circ$

**The correct answer is E.**

28. The time it takes to construct a hut is inversely proportional to the number of workers doing the work. If it takes 40 workers giving 3 hours each to do the job, how long will it take for 140 workers to do the job, to the nearest minute?

- (A) 51 minutes
- (B) 52 minutes
- (C) 53 minutes
- (D) 54 minutes
- (E) 55 minutes

As the product of time taken to construct a hut and the number of workers doing the work is always constant, we have:

$$(3 \text{ hours}) \times (40 \text{ workers}) = (t \text{ hours}) \times (140 \text{ workers})$$

$$\text{or, } t = \frac{120}{140} = \frac{6}{7} \text{ hours}$$

$$= \frac{6}{7} \times 60$$

= approximately 51 minutes.

**The correct answer is A.**

29. If  $2(x-1)^3 + 3 \leq 19$ , then the value of  $x$  must be:
- (A) greater than or equal to 3
  - (B) less than or equal to 3
  - (C) greater than or equal to -3
  - (D) less than or equal to -3
  - (E) less than -3 or greater than 3

$$2(x-1)^3 + 3 \leq 19$$

$$2(x-1)^3 \leq 16$$

$$(x-1)^3 \leq 8$$

$$x-1 \leq 2$$

$$x \leq 3$$

**The correct answer is B.**

30. A man pays a rent of Rs. 50 for the first day, Rs. 100 for the second day and so on, with the rent on each day being Rs. 50 more than the rent on the previous day. What is the total rent paid for the first 10 days?

- (A) 2,750
- (B) 2,800
- (C) 3,050
- (D) 3,100
- (E) 3,350

The series is an AP with  $a = 50$ ,  $d = 50$  and  $n = 10$ .

$$S_n = \frac{10}{2} [2 \times 50 + (10-1) \times 50]$$

$$S_n = 5(100 + 450)$$

$$S_n = 5(550)$$

$$S_n = \text{Rs. } 2,750$$

**The correct answer is A.**

31. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

**(Real NMAT Question)**

Three-fourths of the boys in a class are intelligent and there are 18 intelligent boys in the class. What is the number of girls in the class?

- (1) Boys comprise two-thirds of the total number of students in the class; the rest are girls.
- (2) The number of girls is less than the number of boys.
- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

Let  $N_B$  be the number of boys in the class and  $N_G$  be the number of girls in the class.

$$\frac{3}{4} \times N_B = 18$$

$$\text{Therefore, } N_B = 18 \times \frac{4}{3} = 24$$

$$\Rightarrow \text{Total strength of the class } \frac{3}{2} \times N_B = \frac{3}{2} \times 24 = 36$$

$$\text{Number of girls in the class} = 36 - 24 = 12$$

Thus, Statement (1) ALONE is sufficient to determine the number of girls in the class.

From Statement (2) ALONE, we cannot determine the number of girls in the class.

The correct answer is A.

32. Five years ago, the average age of a husband and wife was 35 years. Today, the average age of the husband, wife and a child is 28 years. What was the average age of the couple when the child was born?

(A) 35  
(B) 36  
(C) 38  
(D) 40  
(E) 42

Five years ago, the average age of the couple was 35 years. Today, the average age of the couple will be 40 years. Therefore, the total age of the couple will be 80 years.

Average age of the husband, wife and child = 28 years.

Total age of the family =  $28 \times 3 = 84$  years.

Age of the child is 4 years and so the child was born 4 years ago.

Average age of the couple 4 years ago =  $35 + 1 = 36$  years.

The correct answer is B.

33. In a race of 875 m, A can beat B by 175 m. In another race of 6,300 m, B can beat C by 1,575 m. By what distance can A beat C in a race of 2,187.5 m? (Real NMAT Question)

(A) 175 m  
(B) 525 m  
(C) 875 m  
(D) 1,225 m  
(E) 1,575 m

As A can beat B by 175 m in a race of 875 m, when A covers 875 m, B covers 700 m.

Also, as B can beat C by 1,575 m in a race of 6,300 m, when B covers 6,300 m, C covers 4,725 m.

Therefore,  $A : B = 875 : 700$ , and

$$B : C = 6,300 : 4,725$$

$$\text{Therefore, } A : B : C = 7,875 : 6,300 : 4,725$$

$\Rightarrow$  When A covers 7,875 m, C covers 4,725 m.

When A covers 2,187.5 m, C covers

$$\frac{(2,187.5 \times 4,725)}{7,875} = 1,312.5 \text{ m}$$

In other words, A can beat C by  $2,187.5 - 1,312.5 = 875$  m, in a race of 2,187.5 m

The correct answer is C.

34. A motorcycle tyre has spokes that go from a centre point in the hub to equally spaced points on the rim of the wheel. If there are fewer than six spokes, what is the smallest possible angle between any two spokes?

(A)  $18^\circ$   
(B)  $30^\circ$   
(C)  $40^\circ$   
(D)  $60^\circ$   
(E)  $72^\circ$

If there are  $n$  spokes, there will be  $n$  angles between them. Thus, the measure of the angle between

spokes is  $\frac{360}{n}$

Since  $n < 6$ , we can rewrite this expression as

$\frac{360}{(\text{less than } 6)}$ , which means the answer has to be greater than  $60^\circ$ .

The only answer choice that matches this requirement is E.

The correct answer is E.

35. If  $|3a + 7| \geq 2a + 12$ , then

(A)  $a \leq -\frac{19}{5}$   
(B)  $a \geq -\frac{19}{5}$   
(C)  $a \geq 5$   
(D)  $a \leq -\frac{19}{5}$  or  $a \geq 5$   
(E)  $-\frac{19}{5} \leq a \leq 5$

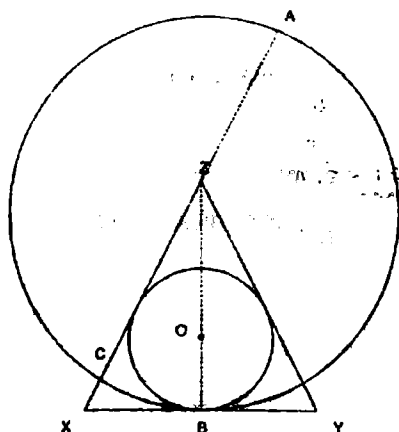
$$\begin{aligned}
 (3a+7) &\geq 2a+12 & \text{or} & \quad -(3a+7) \geq 2a+12 \\
 a+7 &\geq 12 & \text{or} & \quad -3a-7 \geq 2a+12 \\
 a &\geq 5 & \text{or} & \quad -7 \geq 5a+12 \\
 & & \text{or} & \quad -\frac{19}{5} \geq a
 \end{aligned}$$

The correct answer is D.

36. A circle is drawn inside an isosceles triangle XYZ (ZX = ZY) with O as centre. Another circle is drawn taking Z as the centre such that it touches the side XY at the same point as the smaller circle. The side XZ when extended meets the bigger circle at point A such that XA = 18 cm. If the radius of the bigger circle is 8 cm, find the area of the smaller circle.  
(Real NMAT Question)

- (A)  $9\pi$   
(B)  $11\pi$   
(C)  $12\pi$   
(D)  $15\pi$   
(E)  $18\pi$

It will be easier to solve this question if you first draw the figure. This is how it will look:



Diameter of the larger circle is 8. So  $AZ = ZC = 8$ .

Since  $XA = 18$ ,  $XC = 18 - 16 = 2$

Thus,  $XZ = 2 + 8 = 10$

In the figure ZB is also the radius of the larger circle and it is also the altitude of the triangle.

According to Pythagoras theorem, in the right triangle XZB,  $XZ^2 = ZB^2 + XB^2$

$$\text{or, } 10^2 = 8^2 + XB^2$$

$$\text{or, } 100 = 64 + XB^2$$

$$\text{or, } XB = \sqrt{36} = 6$$

$$\text{So, } XY = 2XB = 12$$

$$\text{Area of triangle XZY} = \frac{1}{2} \times XY \times ZB$$

$$\begin{aligned}
 &= \frac{1}{2} \times 12 \times 8 \\
 &= 48
 \end{aligned}$$

Radius of a circle inscribed in a triangle

$$= \frac{\text{Area of triangle}}{\left(\frac{\text{sum of sides of a triangle}}{2}\right)} = \frac{48}{\left(\frac{32}{2}\right)} = \frac{48}{16} = 3$$

$$\begin{aligned}
 \text{Therefore, area of the smaller circle} &= \pi r^2 \\
 &= \pi 3^2 = 9\pi
 \end{aligned}$$

The correct answer is A.

37. A bag contains five red and nine black balls, while another has three red and five black balls. A ball is first selected at random from bag 1 and transferred to bag 2, and then a ball is drawn from bag 2. What is the probability that the ball drawn is red?

- (A)  $\frac{25}{103}$   
(B)  $\frac{47}{126}$   
(C)  $\frac{33}{97}$   
(D)  $\frac{47}{97}$   
(E)  $\frac{61}{131}$

We need to consider both the cases here.

Red ball is transferred, and then red ball is drawn.

Black ball is transferred, and then red ball is drawn.

$$\begin{aligned}
 &= \frac{5}{14} \times \frac{4}{9} + \frac{9}{14} \times \frac{3}{9} \\
 &= \frac{20}{126} + \frac{27}{126} = \frac{47}{126}
 \end{aligned}$$

The correct answer is B.

38. In a class having 60% girls, 40% of the students qualified in a test. If 50% of the girls qualified, find the number of boys who did not qualify in the test as a percentage of the total strength of the class?

- (A) 10%  
(B) 30%  
(C) 45%  
(D) 55%  
(E) 90%

Let the total number of students in the class be 100.  
Then the number of girls = 60 and number of boys =

40. Total number of students who qualified = 40% of 100 = 40. Of those 40 students, 30 are girls (since 50% of the girls have qualified and 50% of 60 = 30). So, 10 boys have qualified, which means that 30 boys have not qualified.

Therefore, as a percentage of the total strength of the class, 30% of the boys have not qualified.

The correct answer is B.

39. The side of a square was decreased by  $y\%$  and, hence, the area decreased by 11.64%. Find the value of  $y$ .

- (A) 4%  
(B) 5.5%  
(C) 6%  
(D) 6.5%  
(E) 7%

The decrease in side by  $y\%$  implies

$$-y - y + \left(\frac{y^2}{100}\right) = -11.64$$

$$-200y + y^2 = -1,164$$

$$y^2 - 200y + 1,164 = 0$$

Solving the quadratic we get  $y = 6\%$ , that is, 6% decrease.

The correct answer is C.

40. If  $x$  is an integer and  $\sqrt{192} < x\sqrt{12}$  and

$\frac{x}{\sqrt{12}} < \sqrt{12}$ , which of the following can be the value of  $x$ ?

- (A) 2  
(B) 3  
(C) 4  
(D) 5  
(E) 12

$$\sqrt{192} < x\sqrt{12},$$

$$\text{or, } \frac{\sqrt{192}}{\sqrt{12}} < x$$

$$\text{or, } \sqrt{16} < x$$

$$\text{or, } 4 < x$$

Similarly,

$$\frac{x}{\sqrt{12}} < \sqrt{12}$$

$$\text{or, } x < \sqrt{12} \times \sqrt{12}$$

or,  $x < 12$

The correct answer is D.

41. Find the smallest number which when divided by 8, 12, 15, 20 leaves remainders of 4, 8, 11 and 16 respectively and it leaves a remainder of 10 when divided by 11. (Real NMAT Question)

- (A) 356  
(B) 596  
(C) 956  
(D) 1,196  
(E) 1,436

Long method:

In this question we have to find the smallest number which satisfies 2 conditions simultaneously-

1. It leaves remainder of 4, 8, 11 and 16 respectively when divided by 8, 12, 15 and 20.
2. It leaves remainder of 10 when divided by 11.

For 1st condition as we can observe in all cases (divisor - remainder) is the same, that is  $8 - 4 = 12 - 8 = 15 - 11 = 20 - 16 = 4$ .

Thus, the numbers that satisfy this condition, by the property of LCM are (Multiples of LCM of 8, 12, 15 and 20) - 4

That is, (Multiples of 120) - 4 = 116, 236, 356 and so on.

We will now check which of these possible answers satisfies the second condition that is, we will divide each of these numbers by 11. 956 is the first number that gives a remainder of 10 when divided by 11 and should be the correct answer.

Short method:

Back solve from the answer choices, that is, starting from 356, try dividing each option by 11 and see if you get a remainder of 10.

$$\frac{356}{11} \text{ gives you a remainder of 4.}$$

$$\frac{596}{11} \text{ gives you a remainder of 2.}$$

$$\frac{956}{11} \text{ gives you a remainder of 10.}$$

$$\frac{1,196}{11} \text{ gives you a remainder 8.}$$

$$\frac{1,436}{11} \text{ gives a remainder of 6.}$$

The correct answer is C.

42. If  $\left|\frac{a}{b}\right|$  and  $\left|\frac{x}{y}\right|$  are reciprocals, and  $\left(\frac{a}{b}\right)\left(\frac{x}{y}\right) < 0$ , which of the following must be true?

- (A)  $ab < 0$   
 (B)  $\frac{a}{b}\left(\frac{x}{y}\right) < -1$   
 (C)  $\frac{a}{b} < 1$   
 (D)  $\frac{a}{b} = -\frac{y}{x}$   
 (E)  $\frac{y}{x} > \frac{a}{b}$

If  $\left(\frac{a}{b}\right)\left(\frac{x}{y}\right) < 0$ , then the two fractions must have opposite signs, that is,  $\left(\frac{a}{b}\right)$  must be the negative inverse of  $\left|\frac{x}{y}\right|$  or  $\left|\frac{a}{b}\right| = -\left(\frac{y}{x}\right)$ .

Thus, D is the answer. The other choices may or may not be true.

The correct answer is D.

43. If  $a^x = b^y = c^z$  and  $b^2 = ac$ , find the value of  $y$  in terms of  $x$  and  $z$ .

- (A)  $\frac{xz}{z} + x$   
 (B)  $\frac{x}{z} + x$   
 (C)  $\frac{2xz}{x+z}$   
 (D)  $\frac{x+z}{z}$   
 (E) None of these

Given that:  $a^x = b^y = c^z$  and  $b^2 = ac$ .

Let  $a^x = b^y = c^z = k$ . Therefore,

$$\begin{aligned} a &= k^{1/x} \\ b &= k^{1/y} \\ c &= k^{1/z} \\ b^2 &= (k^{1/y})^2 = k^{2/y} \\ ac &= k^{1/x + 1/z} \end{aligned}$$

Therefore,

$$\begin{aligned} \frac{2}{y} &= \frac{1}{x} + \frac{1}{z} \\ \frac{2}{y} &= \frac{x+z}{xz} \\ y &= \frac{2xz}{x+z} \end{aligned}$$

The correct answer is C.

44. If the collection of a movie is Rs. 100,000 for the first day, Rs. 120,000 for the second day, Rs. 140,000 for the third day and so on, that is, the collection increases by Rs. 20,000 every day, then find the total collection for the first 10 days.

- (A) Rs. 1200,000  
 (B) Rs. 1400,000  
 (C) Rs. 1600,000  
 (D) Rs. 1700,000  
 (E) Rs. 1900,000

The collection figures are in AP, with the first term as 100,000 and the common difference is 20,000.

Then,

$$\begin{aligned} S_{10} &= \frac{10}{2} [2a + (n-1) \times d] \\ &= 5[200,000 + (9 \times 20,000)] \\ &= 5(380,000) \\ &= \text{Rs. } 1,900,000 \end{aligned}$$

The correct answer is E.

45. Three cards are drawn from a pack of cards at random. Find the probability that they consist of two colours.

- (A)  $\frac{{}^{26}C_1 \times {}^{26}C_2}{{}^{52}C_3}$   
 (B)  $\frac{2 \times {}^{26}C_1 \times {}^{26}C_2}{{}^{52}C_3}$   
 (C)  $\frac{{}^{26}C_3}{{}^{52}C_3}$   
 (D)  $\frac{2 \times {}^{26}C_1 \times {}^{26}C_2}{{}^{52}C_3}$  and  $\frac{{}^{26}C_3}{{}^{52}C_3}$   
 (E) None of these

Number of favourable cases = 2 red and 1 black or 1 red and 2 black

$$= {}^{26}C_2 \times {}^{26}C_1 + {}^{26}C_1 \times {}^{26}C_2 = 2 \times {}^{26}C_2 \times {}^{26}C_1$$

$$\text{Total cases} = {}^{52}C_3$$

Therefore, required probability =  $\frac{2 \times {}^{26}C_2 \times {}^{26}C_1}{{}^{52}C_3}$

The correct answer is B.

46. Ashim is creating a mathematical quiz for his students. He is thinking of a geometric progression in which the third term is 16 and the sixth term is twice the square of the second term. What is the eleventh term in this geometric progression?  
(Real NMAT Question)

- (A) 1,024  
(B) 2,048  
(C) 4,096  
(D) 6,144  
(E) 8,192

Let  $a$  and  $r$  be the 1<sup>st</sup> term and common ratio of the given GP.

So, 3<sup>rd</sup> term =  $ar^2 = 16$

$$a = \frac{16}{r^2}$$

6<sup>th</sup> term =  $2 \times (2^{\text{nd}} \text{ term})^2 = 2 \times (ar)^2 = 2a^2r^2 =$

$$2 \times \left(\frac{16}{r^2}\right)^2 \times r^2 = \frac{512}{r^2}$$

But, the 6<sup>th</sup> term is  $ar^5$ . Hence we have

$$ar^5 = \frac{512}{r^2}$$

$$\frac{16}{r^2} \times r^2 = \frac{512}{r^2}$$

$$\text{So, } r^5 = \frac{512}{16} = 32$$

Hence,  $r = 2$

$$\text{Now as } a = \frac{16}{r^2} = \frac{16}{2^2} = \frac{16}{4} = 4$$

Hence 11<sup>th</sup> term of series is  $ar^{10} = 4 \times (2)^{10} = 4,096$

The correct answer is C.

47. The interest rate, compounded annually, that would bring a principal of Rs.1,200 to a final value of Rs.1,650 in 2 years is approximately:
- (A) 17%  
(B) 18%  
(C) 19%  
(D) 20%  
(E) 21%

$$A = P \left[ 1 + \left( \frac{r}{100} \right) \right]^T$$

(where A = amount; P = principle;  $r$  = rate of interest;  $t$  = time intervals)

$$\text{or, } 1650 = 1200 \left[ 1 + \left( \frac{r}{100} \right) \right]^2$$

$$\text{or, } \frac{1650}{1200} = \left[ 1 + \left( \frac{r}{100} \right) \right]^2$$

$$\text{or, } \sqrt{1.375} = 1 + \left( \frac{r}{100} \right)$$

$$\text{or, } 1.172 = 1 + \left( \frac{r}{100} \right)$$

Thus,  $r$  = approximately 17%.

The correct answer is A.

48. A started a business with a capital of Rs. 5,000. Three months later, B joined with a capital of Rs. 7,000. After another 3 months, A invested Rs. 1,000 more while B withdrew Rs. 2,000. Two months later, C joined with a capital of Rs. 5,000. In what ratio should the profits get divided at the end of the year?

- (A) 22:4:17  
(B) 22:17:8  
(C) 22:17:4  
(D) 66:51:20  
(E) 66:17:20

As per the problem:

$$\begin{aligned} \text{Equivalent contribution of A} &= 5,000 \times 6 + 6,000 \times 6 \\ &= 6,6000 \end{aligned}$$

$$\begin{aligned} \text{Equivalent contribution of B} &= 7,000 \times 3 + 5,000 \times 6 \\ &= 51,000 \end{aligned}$$

$$\text{Equivalent contribution of C} = 5,000 \times 4 = 20,000$$

Therefore, the required ratio = 66:51:20.

The correct answer is D.



Directions for Questions 49–52: Go through the given graphs and solve the questions based on them.  
(Real NMAT Question)

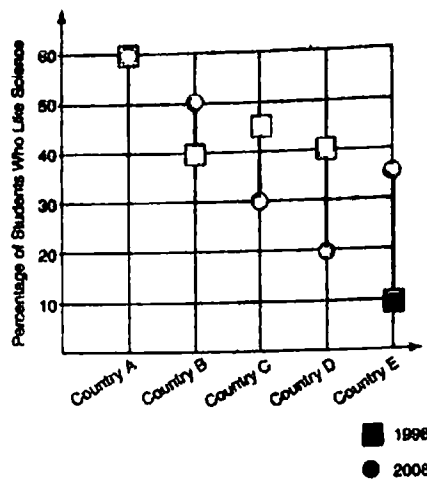


Figure 1

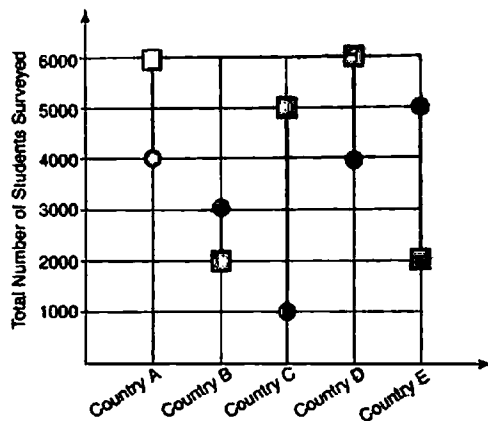


Figure 2

Here we are given the percentage of students who like science in fig 1 and total number of students surveyed in fig 2. Using the two figures, we can compute the number of students who like science for all 5 countries for 1998 and 2008 as below.

Number of students who like science:

Country	1998	2008
A	60% of 6,000	60% of 4,000
B	40% of 2,000	50% of 3,000
C	45% of 5,000	30% of 1,000
D	40% of 6,000	20% of 4,000
E	10% of 2,000	35% of 5,000

Country	1998	2008
A	3,600	2,400
B	800	1,500
C	2,250	300
D	2,400	800
E	200	1,750
Total	9,250	6,750

49. In 2010, the total number of students surveyed in the five countries who liked science was 8,450. Which statement is true about the total number of students surveyed in the five countries who liked science?
- (A) It remained the same between 1998 and 2008 but changed between 2008 and 2010.
- (B) It increased by 13.05% between 1998 and 2008 but decreased by 15.03% between 2008 and 2010.
- (C) It decreased by 13.05% between 1998 and 2008 but increased by 15.03% between 2008 and 2010.
- (D) It increased by 27.03% between 1998 and 2008 but decreased by 25.19% between 2008 and 2010.
- (E) It decreased by 27.03% between 1998 and 2008 but increased by 25.19% between 2008 and 2010.

From the table we made earlier, we know that the total number of students who like science was 9,250 in 1998 and 6,750 in 2008

$$\text{Percentage decrease between 1998 and 2008} = \frac{(9,250 - 6,750)}{9,250} \times 100 = \frac{2,500}{9,250} \times 100 = 27.03\%$$

Now given that number of students who were surveyed and were loving science in 2010 was 8,450

$$\text{So percentage increase from 2008 to 2010 is} = \frac{(8,450 - 6,750)}{6,750} \times 100 = \frac{1,700}{6,750} \times 100 = 25.19\%$$

The correct answer is E.

50. In the year 2000, the total number of students surveyed in the five countries who liked science was 10% more than the total number of students surveyed in the five countries in 1998 who did not like science. Out of the total number of students surveyed in the five countries who liked science in the year 2000, there were 2,000 students who liked only physics but not chemistry and biology. 4,346

students who liked only chemistry but not physics and biology and 5,579 students who liked biology. How many students surveyed in the five countries who liked science in the year 2000 did not like biology but liked both physics and chemistry?

- (A) 925
- (B) 1,000
- (C) 1,320
- (D) 2,425
- (E) 2,835

We use information from solution of Q 49.

Total number of students surveyed in 1998 = 21,000

Number of students who liked science = 9,250

Number of students who did not like science =  
 $21,000 - 9,250 = 11,750$

Number of students surveyed who liked science in 2000 =  $11,750 + 10\%$  of  $11,750 = 11,750 + 1,175 = 12,925$

Now, we consider these 12,925 students make a universal set where

$A$  = set of students who like Physics,  $A^c$  = complement of set  $A$  that is those students who don't like Physics

$B$  = set of students who like Chemistry,  $B^c$  = complement of set  $B$  that is those students who don't like Chemistry

$C$  = set of students who like Biology,  $C^c$  = complement of set  $C$  that is those students who don't like Biology

$$n(A \cup B \cup C) = n(A \cap B^c \cap C^c) + n(B \cap C^c \cap A^c) + n(C) + n(A \cap B \cap C^c)$$

$$12,925 = 2,000 + 4,346 + 5,579 + n(A \cap B \cap C^c)$$

$$n(A \cap B \cap C^c) = 1,000$$

So, number of students who like both Physics and Chemistry but not Biology is 1,000.

**The correct answer is B.**

51. In 2010, this survey was conducted in Country F. The number of students of Country F who participated in the survey was equal to the difference between the number of students surveyed in countries A, B, C, D and E who liked science in 2008 and the number of students surveyed in countries A, B, C, D and E who liked science in 1998. What was the sample size of the survey conducted in Country F in the year 2010?
- (A) 2,500
  - (B) 4,250
  - (C) 5,500
  - (D) 6,750
  - (E) 9,250

We use table made for Q 49.

Difference between students who like science in 1998 and 2008 =  $9,250 - 6,750 = 2,500$

Sample size of survey conducted in country F in 2010 is 2,500

**The correct answer is A.**

52. All the countries which recorded a percentage change of less than 50% in the number of students who liked science from 1998 to 2008, were surveyed for a second time in 2008 to verify the results. When the same population was surveyed for a second time for those countries, it was found that the data was 900 more than the actual value for 2008. What was the percentage error in plotting the value for 2008?

- (A) 50%
- (B) 60%
- (C) 75%
- (D) 85%
- (E) 90%

The total number of students surveyed in the five countries in 1998 who liked science:

Country A: 3,600; Country B: 800; Country C: 2,250; Country D: 2,400; Country E: 200

The total number of students surveyed in the five countries in 2008 who liked science:

Country A: 2,400; Country B: 1,500; Country C: 300; Country D: 800; Country E: 1,750

% decrease for:

Country A = 33.33%; Country B = 87.5%; Country C = 86.67%; Country D = 66.67%; Country E = 77.5%

Only Country A recorded a percentage change of less than 50%. Hence, only Country A was surveyed for a second time in 2008. For the same population surveyed, correct number of Country A students who liked science in 2008 =  $2400 - 900 = 1500$ .

$$\text{Percentage error} = 900 \times \frac{100}{1,500} = 60\%$$

**The correct answer is B.**

53. If  $\frac{3}{4}$  of all the chocolates have nuts and  $\frac{1}{3}$  of all the chocolates have both nuts and fruits, then what fraction of all the chocolates has nuts but no fruits?
- (A)  $\frac{1}{4}$
  - (B)  $\frac{5}{12}$
  - (C)  $\frac{1}{2}$

- (D)  $\frac{7}{12}$   
 (E)  $\frac{5}{6}$

Since  $\frac{3}{4}$  of the chocolates have nuts and  $\frac{1}{3}$  of the chocolates have both nuts and fruits, we can simply subtract  $\frac{3}{4} - \frac{1}{3}$  to get all the chocolates with nuts but no fruit.

$$\frac{3}{4} - \frac{1}{3} = \frac{5}{12}$$

The correct answer is B.

54. A mixture of sand and gravel has 6 kg of sand for every 2 kg of gravel. If 200 kg of this mixture is made, how many kg of sand is required?
- (A) 25  
 (B) 30  
 (C) 50  
 (D) 100  
 (E) 150

$$\frac{\text{Sand}}{\text{Gravel}} = \frac{6}{2} = \frac{3}{1}$$

Thus, total sand required =  $\frac{3}{4} \times 200 = 150$  kg

The correct answer is E.

55. C is the midpoint of line segment AB. The coordinates of A are (-2, 6) and the coordinates of C are (2, 0). What are the coordinates of B?
- (A) (2, 6)  
 (B) (2, 0)  
 (C) (0, -6)  
 (D) (6, -6)  
 (E) (3, 0)

Let the coordinates of B be x and y.

Now, as per midpoint formula

$$\begin{aligned} -\frac{(-2+x)}{2} &= 2 \text{ and } \frac{(6+y)}{2} = 0 \\ -2+x &= 4 \text{ and } 6+y = 0 \\ x &= 6 \text{ and } y = -6 \end{aligned}$$

So, the coordinates of B are (6, -6).

The correct answer is D.

56. Which of the following is equal to  $\left(\frac{\sqrt{12}}{5}\right)\left(\frac{\sqrt{60}}{2^4}\right)\left(\frac{\sqrt{45}}{3^2}\right)$ ?

- (A)  $\frac{1}{12}$   
 (B)  $\frac{1}{6}$   
 (C)  $\frac{1}{4}$   
 (D)  $\frac{1}{3}$   
 (E)  $\frac{1}{2}$

$$\sqrt{12} = 2\sqrt{3}$$

$$\sqrt{60} = 2\sqrt{15}$$

$$\sqrt{45} = 3\sqrt{5}$$

Thus, we get

$$\begin{aligned} \frac{2\sqrt{3}}{5} \times \frac{2\sqrt{15}}{2^4} \times \frac{3\sqrt{5}}{3^2} &= \frac{\sqrt{3}}{5} \times \frac{\sqrt{15}}{2^4} \times \frac{\sqrt{5}}{3^2} \\ &= \frac{\sqrt{3}}{5} \times \frac{\sqrt{15}}{2^2} \times \frac{\sqrt{5}}{3^2} = \frac{\sqrt{3}}{5} \times \frac{\sqrt{3}\sqrt{5}}{2^2} \times \frac{\sqrt{5}}{3} \\ &= \left(\frac{3 \times 5}{2^2 \times 3}\right) = \frac{1}{4} \end{aligned}$$

The correct answer is C.

57. Express  $7.58\bar{3}$  as a fraction:

- (A)  $\frac{91}{12}$   
 (B)  $\frac{44}{6}$   
 (C)  $\frac{99}{14}$   
 (D)  $\frac{22}{3}$   
 (E)  $\frac{148}{21}$

$$0.\bar{3} = 0.3333 = \frac{1}{3}$$

$$\text{Thus, } 0.00\bar{3} = \frac{1}{3} \times \frac{1}{100} = \frac{1}{300}$$

Thus,  $7.58\bar{3} = 7.58 + 0.00\bar{3}$

$$\begin{aligned} &= \frac{758}{100} + \frac{1}{300} \\ &= \frac{2275}{300} = \frac{91}{12} \end{aligned}$$

The correct answer is A.

58. Given that  $1,176 = 2^p \times 3^q \times 7^r$ , find the value of  $p + q + r$ .

(A) 6  
(B) 8  
(C) 9  
(D) 10  
(E) 12

The given number can be written as

$$\begin{aligned} 1176 &= 4 \times 294 = 4 \times 3 \times 98 \\ &= 4 \times 3 \times 2 \times 49 = 2^3 \times 3^1 \times 7^2 \end{aligned}$$

Since  $1176 = 2^p \times 3^q \times 7^r$ , therefore,  $p = 3$ ,  $q = 1$  and  $r = 2$ .

Hence,  $p + q + r = 3 + 1 + 2 = 6$ .

The correct answer is A.

59. If  $3^x - 3^{(x-1)} = 18$ , find  $x$ .

(A) 2  
(B) 3  
(C) 5  
(D) 6  
(E) 7

To understand how to solve such questions, let's pick any random value for  $x$ . Let  $x = 5$ . So

$$3^5 - 3(5-1) = 18$$

$$\text{or, } 3^5 - 3^4 = 18$$

$$\text{or, } 3^4(3-1) = 18$$

$$\text{or, } 3^4(2) = 18$$

$$\text{or, } 3^4 = 9, \text{ and so on}$$

Now, let's apply this method to our question:

$$3^x - 3^{(x-1)} = 18$$

$$3^{(x-1)}(3-1) = 18$$

$$3^{(x-1)}(2) = 18$$

$$3^{(x-1)} = 9 = 3^2$$

Therefore,  $(x-1) = 2$  or  $x = 2 + 1 = 3$

The correct answer is B.

60. If  $m$  and  $n$  are whole numbers such that  $m^n = 81$  and  $m$  is not greater than 5, find the value of  $(m-1)^{(n+1)}$ .

(A) 16  
(B) 25  
(C) 32  
(D) 88  
(E) 110

Since  $m$  is not greater than 5, therefore,  $m = 3$  and  $n = 4$ .

$$m - 1 = 3 - 1 = 2$$

$$n + 1 = 4 + 1 = 5$$

Required value  $= 2^5 = 32$

The correct answer is C.

61. If the arithmetic mean of two numbers is three times their geometric mean, then the ratio of the numbers can be given by: (Real NMAT Question)

(A)  $(17 - 12\sqrt{2}) : 2$   
(B)  $(17 \pm 12\sqrt{2}) : 1$   
(C)  $(34 - 24\sqrt{2}) : 1$   
(D)  $(17 + 12\sqrt{2}) : 2$   
(E)  $(33 + 24\sqrt{2}) : 2$

Let the two numbers be  $a$  and  $b$ .

$$\frac{a+b}{2} = 3\sqrt{ab}$$

$$\left(\frac{a+b}{2}\right)^2 = 9ab$$

$$a^2 + b^2 - 34ab = 0$$

$$\frac{a^2}{b^2} - 34\frac{a}{b} + 1 = 0$$

$$\frac{a}{b} = \frac{17 \pm 12\sqrt{2}}{1}$$

The correct answer is B.

62. The number that is 50% greater than 80 is what percent less than the number that is 25% less than 200?

(A) 5%  
(B) 10%  
(C) 15%  
(D) 20%  
(E) 25%

The number that is 50% greater than 80 =  $1.5(80)$   
= 120.

Similarly, the number that is 25% less than 200  
=  $0.75(200)$  = 150.

Thus, the required percentage =  $\frac{30}{150} \times 100$   
= 20%

The correct answer is D.

63. Aakash spends 50% of his income on rent, utilities, and insurance, and 20% on food. If he spends 30% of the remainder on video games and has no other expenditure, what percent of his income is left after all the expenditure?

(A) 30%  
(B) 21%  
(C) 20%  
(D) 9%  
(E) 0%

The expenditure on rent, utilities, and insurance  
= 50%

The expenditure on food = 20%

The total expenditure on rent, utilities, insurance and food =  $50\% + 20\% = 70\%$ .

The income left =  $100\% - 30\% = 30\%$

The expenditure on video games = 30% of 30%  
=  $0.30 \times 0.30 = 0.09$ , or 9%.

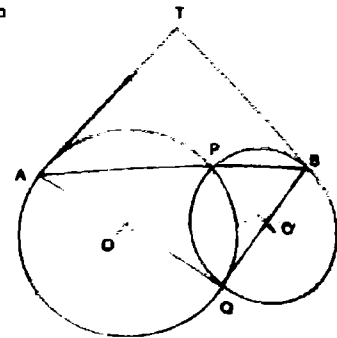
Therefore, the percentage of the income left after all of the expenditure =  $30\% - 9\% = 21\%$

The correct answer is B.

64. Two circles intersect at points P and Q. A secant passing through P intersects the circles at A and B respectively. Tangents to the circles at Q pass through their respective centres to intersect the circles at A and B, respectively. Tangents to the circles at A and B intersect at T. Then what is  $\angle ATB + \angle AQB = ?$

(Real NMAT Question)

(A)  $90^\circ$   
(B)  $150^\circ$   
(C)  $180^\circ$   
(D)  $260^\circ$   
(E)  $320^\circ$



$\angle QAT = 90^\circ$  and  $\angle QBT = 90^\circ$  (The tangent at any point of a circle and the radius through the point are perpendicular to each other.)

$\angle QAT + \angle ATB + \angle QBT + \angle AQB = 360^\circ$  (Angle sum property of a quadrilateral)

Therefore,  $\angle ATB + \angle AQB = 360^\circ - (90^\circ + 90^\circ) = 180^\circ$

The correct answer is C.

65. 50 kg of a product is sold and the profit generated is equal to the cost price of 20 kg of the product. Find the profit percentage made.

(A) 20%  
(B) 25%  
(C) 35%  
(D) 40%  
(E) 45%

As per the problem, we have

$$SP \text{ of } 50 \text{ kg} - CP \text{ of } 50 \text{ kg} = CP \text{ of } 20 \text{ kg}$$

or,

$$CP \text{ of } 70 \text{ kg} = SP \text{ of } 50 \text{ kg}$$

Therefore,

$$\frac{70 - 50}{50} \times 100 = 40\%$$

The correct answer is D.

66. A warehouse contains 1,200 shoes in total, 600 shoes for the left foot and 600 shoes for the right foot. Of these 1,200 shoes, 400 shoes are size 8, 400 shoes are size 9 and the remaining 400 shoes are size 10. What is the minimum number of usable shoes? (Real NMAT Question)

(A) 150  
(B) 200  
(C) 250  
(D) 300  
(E) 400

Rationale:

For a pair of shoes to be usable,

- both the shoes should belong to the same size; and
- one of the shoes should be for the left foot and the other should be for the right foot.

Minimum number of usable shoes can be found out by calculating the maximum number of non-usable shoes. The scenario in which the number of non-usable shoes is maximum corresponds to the one in which all 400 shoes of a particular size (say, size 8) are for left foot and all 400 shoes of another size (say, size 9) are for the right foot. In such a case, remaining shoes for the left and the right foot are 400 each. Also, all these 400 shoes belong to size 10. Therefore, the minimum number of usable pairs of shoes is 200.

The correct answer is B.

67. Prakash bought a bag of 15 magic pencils for Rs.60. One-third of the pencils cost Rs. 2 each and the rest cost Rs. 5 each. If there was a hole in the bag and all of the more expensive pencils fell out, the lost pencils represented approximately what percentage of the money Prakash paid for all the pencils?

- (A) 7%
- (B) 13%
- (C) 67%
- (D) 83%
- (E) 88%

$\frac{1}{3}$  of all the pencils is 5 pencils. These 5 pencils

each cost Rs. 2, for a total of Rs. 10.

The remaining 10 pencils cost Rs. 5 each, for a total of Rs. 50.

If all of these more expensive pencils are lost, then the lost pencils represent  $\frac{50}{60}$  of all the money paid.

Thus, required % =  $\frac{50}{60} \times 100$  = approximately 83%

The correct answer is D.

68. In a class of 40 students, exactly 90% had lower marks than Varun's marks. 60 new students join Varun's class. If Varun's marks were higher than those of 80% of the new arrivals, what percent of the combined class now had higher marks than Varun's marks?

- (A) 86%
- (B) 85%
- (C) 16%

(D) 15%

(E) 14%

90% of 40 students or  $0.9(40) = 36$  students had lower marks than Varun.

Of the 60 new students, 80% or  $0.80(60) = 48$  students had lower marks than Varun.

Thus,  $36 + 48 = 84$  students in the new, larger class have marks lower than Varun.

The new class has 100 students, 84 of whom have lower marks than Varun.

There are 16 students remaining, one of which is Varun. Since Varun has the lowest marks of this group of 16 students, there are 15 students above him.

Since the class has exactly 100 students, the

required percentage =  $\frac{15}{100} \times 100 = 15\%$ .

The correct answer is D.

69. A chemist is mixing a solution of ink and water. She currently has 30 litres of mixture solution, of which 10 litres are ink. How many litres of ink should the chemist add to her current mixture to attain a 50:50 mixture of ink and water if no additional water is added?

- (A) 2.5
- (B) 5
- (C) 10
- (D) 15
- (E) 20

The chemist now has 10 litres of ink in a 30-litre mixture, so she must have 20 litres of water. You want to know the amount of ink you must add in order to make this mixture a 50% solution. Since no additional water is added, the solution must finish with 20 litres of water. Therefore, she also needs a total of 20 litres of ink, or 10 more litres than the mixture currently contains.

The correct answer is C.

70. A full glass of lemonade is a mixture of 20% lime juice and 80% soda. The contents of the glass are poured into a pitcher that is 200% bigger than the glass. The remainder of the pitcher is filled with 16 litres of water. What was the original volume of lime juice in the mixture?

- (A) 1.6 litres
- (B) 3.2 litres
- (C) 4.8 litres
- (D) 6.4 litres
- (E) 8 litres

200% bigger means 'three times as big as' the original. If the pitcher is three times as big as the glass, then pouring the contents of the glass into the

pitcher will make the pitcher  $\frac{1}{3}$  full. If adding another

16 litres fills up the pitcher, the 16 litres must be

equal to the remaining  $\frac{2}{3}$  of the pitcher's capacity.

Then,  $\frac{1}{3}$  of the pitcher's capacity =  $\frac{16}{2} = 8$  litres.

So, the quantity of the juice mixture = 8 litres.

Therefore, the volume of lime juice in the mixture = 20% of 8 litres.

=  $(8 \times 0.2) = 1.6$  litres

The correct answer is A.

71. Company H distributed Rs. 4,000 and 180 pens evenly among its employees, with each employee getting an equal integer number of Rupees and an equal integer number of pens. What is the highest number of employees that could work for Company H?

- (A) 9  
(B) 10  
(C) 20  
(D) 40  
(E) 180

The answer is the greatest common factor (GCF) of the two numbers.

$$4,000 = 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \\ = 2^5 \times 5^3$$

$$180 = 2 \times 2 \times 3 \times 3 \times 5 = 2^2 \times 3^2 \times 5$$

These numbers have  $2 \times 2 \times 5$  in common, so 20 is the GCF.

The correct answer is C.

72. Each factor of 210 is written on a piece of paper, and all the pieces of paper are mixed up. If a piece of paper is randomly picked up from this mix, what is the probability that a multiple of 42 is written on the paper?

- (A)  $\frac{1}{16}$   
(B)  $\frac{5}{42}$   
(C)  $\frac{1}{8}$

(D)  $\frac{3}{16}$

(E)  $\frac{1}{4}$

The factors of 210 are as follows:

1 and 210

2 and 105

3 and 70

5 and 42

6 and 35

7 and 30

10 and 21

14 and 15

Out of the list of 16 factors, there are two multiples of 42 (42 and 210).

Thus, the answer is  $\frac{2}{16}$  or  $\frac{1}{8}$ .

The correct answer is C.

Data for Questions 73–75: Go through the following information and solve the questions based on them.

Current structure	
Equity	28%
Debt	22%
Cash	4%
Real Estate	46%

Proposed structure	
Equity	70%
Debt	25%
Cash	5%

73. If the real estate property of Alok is currently valued at Rs. 69 lakh, what will be the difference in lakhs between equity and debt in the proposed structure?

- (A) Rs. 150 lakh  
(B) Rs. 9 lakh  
(C) Rs. 82.5 lakh  
(D) Rs. 67.5 lakh  
(E) Rs. 70.5 lakh

As per the problem:

46% of the total = Rs. 69 lakh

Total = Rs. 150 lakh

Difference between equity and debt =  $70 - 25 = 45\%$   
of the total =  $0.45 \times 150 = 4.5 \times 15 = \text{Rs. } 67.5 \text{ lakh}$

The correct answer is D.

74. If the difference between the contribution of equity to that of all the other components put together in the proposed structure is Rs. 16 lakh, find the value of cash in the existing structure.

- (A) Rs. 1.6 lakh  
(B) Rs. 2 lakh  
(C) Rs. 2.6 lakh  
(D) Rs. 4 lakh  
(E) Cannot be determined

As per the problem:

40% of the total = Rs. 16 lakh

Total = Rs. 40 lakh

Cash in the existing structure = 4% of 40 lakh =  
Rs. 1.6 lakh

The correct answer is A.

75. By what percentage is the contribution of equity in the proposed structure more as compared to the contribution of equity in the existing structure?

- (A) 42%  
(B) 100%  
(C) 120%  
(D) 150%  
(E) 200%

The required value will be  $\frac{70 - 28}{28} \times 100$   
 $= \frac{42}{28} \times 100 = 150\%$

The correct answer is D.

76. An increase of 30% in the price of a commodity results in a 21 kg decrease in the quantity of commodity purchased. What was the original amount of the commodity being purchased?

- (A) 52 kg  
(B) 65 kg  
(C) 78 kg  
(D) 83 kg  
(E) 91 kg

Let the original price and quantity be  $p$  and  $q$ , respectively. Then new price will be  $1.3p$  or the new

price is  $\frac{13}{10}$  of the initial value.

If price changes from  $p$  to  $\frac{13p}{10}$ , quantity has to

change from  $q$  to  $\frac{10q}{13}$ .

Difference in quantity is

$$q - \left(\frac{10q}{13}\right) = 21$$

$$\Rightarrow \frac{3q}{13} = 21$$

$$\Rightarrow q = \frac{(21 \times 13)}{3} = 91 \text{ kg}$$

The correct answer is E.

77. If  $t$  is divisible by 12, what is the least possible integer value of  $a$  for which  $\frac{t^2}{2^a}$  might not be an integer?

- (A) 2  
(B) 3  
(C) 5  
(D) 6  
(E) 40

If  $t$  is divisible by 12, then  $t^2$  must be divisible by 144 or  $2 \times 2 \times 2 \times 2 \times 3 \times 3$ . Therefore,  $t^2$  can be divided evenly by 2 at least four times, so  $a$  must be at least 5.

The correct answer is C.

78. If  $5^{k+1} = 2,000$ , what is  $5^k + 1$ ?

- (A) 399  
(B) 401  
(C) 1,996  
(D) 2,000  
(E) 2,001

The key to solving this problem is realising that  $5^{k+1} = 5^k \cdot 5$

Now,  $5^{k+1} = 2,000$

$5^k \cdot 5 = 2,000$

Now divide both sides by 5:

$5^k = 400$

So,  $5^k + 1 = 401$

The correct answer is B.



79. Which of the following is equal to  $(\sqrt[2]{x})(\sqrt[3]{x})$ ?

- (A)  $\sqrt[5]{x}$   
 (B)  $\sqrt[6]{x}$   
 (C)  $\sqrt[3]{x^2}$   
 (D)  $\sqrt[5]{x^6}$   
 (E)  $\sqrt[6]{x^5}$

Since a square root is the same as a  $\frac{1}{2}$  exponent

and a cube root is the same as a  $\frac{1}{3}$  exponent.

Therefore, converting the given expression into fractional exponents, we get:

$$x^{\frac{1}{2}}x^{\frac{1}{3}} = x^{\frac{1}{2} + \frac{1}{3}} = x^{\left(\frac{3}{6} + \frac{2}{6}\right)} = x^{\frac{5}{6}} = \sqrt[6]{x^5}$$

The correct answer is E.

80. If  $125^{14}48^8$  is written out as an integer, how many consecutive zeroes will that integer have at the end?

- (A) 22  
 (B) 32  
 (C) 42  
 (D) 50  
 (E) 112

In order to answer this question, you have to understand what creates zeroes at the end of a number. You will notice that zeroes are created by 10's, each of which is created by one 2 and one 5. So to answer this question, you simply need to work out how many pairs of 2's and 5's are in the given expression

$$125^{14}48^8 = (5^3)^{14} \times (2^4 \times 3)^8 = 5^{42} \times 2^{32} \times 3^8$$

Even though there are 42 powers of 5, there are only 32 powers of 2, so you can only make 32 pairs of one 5 and one 2.

Therefore, the number of consecutive zeroes at the end = 32

The correct answer is B.

**Directions for Questions 81–84:** The following table gives the number of births, deaths and available doctors in four metros of India. Go through the given table and solve the questions based on it. (Real NMAT Question)

City	Births (per '000 per year)	Deaths (per '000 per year)	Number of Doctors (per '000)	Population (Lakh)
Mumbai	250	120	20	100
Kolkata	180	80	50	110
Delhi	150	110	30	120
Chennai	140	70	50	50

81. Which city/cities has the highest death rate per available doctor?

- (A) Mumbai  
 (B) Kolkata  
 (C) Delhi  
 (D) Chennai  
 (E) Delhi and Mumbai

Note that in this question we don't need to find death rate per available doctor in absolute terms. We can easily divide value of column 2 (death per 1,000) with the value in column 3 (number of doctors per 1,000) to arrive at the answer.

$$\text{This ratio for Mumbai is } = \frac{120}{20} = 6$$

$$\text{This ratio for Kolkata is } = \frac{80}{50} = 1.6$$

$$\text{This ratio for Delhi is } = \frac{110}{30} = 3.66$$

$$\text{This ratio for Chennai is } = \frac{70}{50} = 1.4$$

It is clear Mumbai has the highest death rate per available doctor.

The correct answer is A.

82. If improved healthcare reduces the death rate in Mumbai by 10%, then by what percentage does the population growth increase?

- (A) 7%  
 (B) 8.5%  
 (C) 9.2%  
 (D) 10.1%  
 (E) 11.3%

$$\text{Old increase in population} = 130 \text{ per '000}$$

$$\text{New increase in population} = 250 - 108 = 142 \text{ per '000}$$

$$\text{Required percentage increase} = \frac{142 - 130}{130} = 9.2\%$$

The correct answer is C.

83. Which city/cities has/have the highest number of deaths in a year?

(A) Mumbai  
(B) Kolkata  
(C) Delhi  
(D) Chennai  
(E) Mumbai and Chennai

Number of deaths for a city =

$$\frac{(\text{death per } 1,000)}{1,000} \times \text{Population of city}$$

$$\text{Number of deaths in Mumbai} = \left( \frac{120}{1,000} \right) \times 100 \text{ lakh} = 12 \text{ lakh}$$

$$\text{Number of deaths in Kolkata} = \left( \frac{80}{1,000} \right) \times 110 \text{ lakh} = 8.8 \text{ lakh}$$

$$\text{Number of deaths in Delhi} = \left( \frac{110}{1,000} \right) \times 120 \text{ lakh} = 13.2 \text{ lakh}$$

$$\text{Number of deaths in Chennai} = \left( \frac{70}{1,000} \right) \times 50 \text{ lakh} = 3.5 \text{ lakh}$$

Thus, Delhi has the highest number of deaths in a year

The correct answer is C.

84. Which of the given cities would have recorded the highest increase in the population in a year?

(A) Mumbai  
(B) Kolkata  
(C) Delhi  
(D) Chennai  
(E) Delhi and Chennai

Increase in population =

$$\frac{(\text{Increase per } 1,000)}{1,000} \times \text{Population}$$

$$\frac{(\text{Birth per } 1,000 - \text{Death per } 1,000)}{1,000} \times \text{Population}$$

$$\text{Increase in population of Mumbai} = \frac{(250 - 120)}{1,000} \times 100 \text{ lakh} = 13 \text{ lakh}$$

$$\text{Increase in population of Kolkata} = \frac{(180 - 80)}{1,000} \times 110 \text{ lakh} = 11 \text{ lakh}$$

$$\text{Increase in population of Delhi} = \frac{(150 - 110)}{1,000} \times 120 \text{ lakh} = 4.8 \text{ lakh}$$

Increase in population of Chennai =

$$\frac{(140 - 70)}{1,000} \times 50 \text{ lakh} = 3.5 \text{ lakh}$$

Thus, Mumbai records the highest increase in the population in a year.

The correct answer is A.

85. In what quantities should an alloy containing copper and zinc in the ratio 2:1 be mixed with another alloy containing copper and zinc in the ratio 4:5 to get 64 kg of a new alloy with equal quantities of copper and zinc?

(A) 48 kg, 16 kg  
(B) 24 kg, 40 kg  
(C) 32 kg each  
(D) 16 kg, 48 kg  
(E) 24 kg each

Using the structured form, we have

X	Y
2:1	4:5
1:1	

$$\frac{X}{Y} = \frac{\frac{4}{2} - \frac{1}{2}}{\frac{1}{2} - \frac{3}{3}} = \frac{\frac{8-1}{2}}{\frac{3-4}{3}} = \frac{7}{-1} = 1:3$$

So, first alloy  $\left( \frac{1}{4} \text{ of } 64 \right) = 16 \text{ kg}$

and, second alloy  $\left( \frac{3}{4} \text{ of } 64 \right) = 48 \text{ kg}$

The correct answer is D.

86. If  $n$  is the smallest of three consecutive positive integers, which of the following must be true?

(A)  $n$  is divisible by 3  
(B)  $n$  is even  
(C)  $n$  is odd  
(D)  $(n)(n+2)$  is even  
(E)  $n(n+1)(n+2)$  is divisible by 3

For three consecutive integers, the possibilities are [odd, even, odd] or [even, odd, even].

Since  $n$  could be an odd or an even, option (B) and (C) are eliminated.

Option (D) is true only if  $n$  is even, but not if  $n$  is odd, so option (D) is also eliminated.

In any set of three consecutive integers, one of the integers must be divisible by 3, but not necessarily  $n$ , so option (A) is also eliminated.

For the same reason, (E) must be true, as  $n(n+1)(n+2)$  can be thought of as "the product of any three consecutive integers." Since one of these integers must be divisible by 3, the product of those three numbers must also be divisible by 3.

The correct answer is E.

87. If  $\frac{17}{2^{10} \times 5^{13}}$  is expressed as a terminating decimal,

how many zeroes are located to the right of the decimal point before the first non-zero digit?

- (A) 10  
(B) 12  
(C) 13  
(D) 15  
(E) 17

Decimal placement can be determined by how many times a number is multiplied or divided by 10. Multiplying moves the decimal point to the right, and dividing moves the decimal point to the left. Look for powers of 10 in the given fraction, remembering that  $10 = 2 \times 5$ .

$$\frac{17}{2^{10}5^{13}} = \frac{17}{2^{10}5^{10}5^3} = \frac{17}{(2 \times 5)^{10}5^3} = \frac{17}{10^{10}5^3} = \frac{7}{125} \times \frac{1}{10^{10}} = \frac{0.136}{10^{10}}$$

There is no zero to the right of the decimal point before the first non-zero digit in 0.136. However, dividing by  $10^{10}$  will move the decimal to the left 10 places, resulting in 10 zeros between the decimal and the '136' part of the number.

The correct answer is A.

88. If  $25^5 4^6 = 10^x + a$ , and  $x$  is an integer, what could be the minimum positive value of  $a$ ?

- (A) 0  
(B) 30,000  
(C) 30,000,000  
(D) 10,000,000,000  
(E) 30,000,000,000

Note that  $25 \times 4 = 100$ , and the other side of the equation involves a power of 10. Separating out the 'pairs' of 25 and 4 on the left, we have:

$$25^5 4^6 = 10^x + a$$

$$4^1(4^5 25^5) = 10^x + a$$

$$4^1(100)^5 = 10^x + a$$

$$4(10^{10}) = 10^x + a$$

$$40,000,000,000 = [\text{a power of } 10] + a$$

To minimise  $a$  while keeping it positive, maximise the power of 10 while keeping it less than  $25^5 4^6$ .

The greatest power of 10 that is less than 40,000,000,000 is 10,000,000,000, or  $10^{10}$ .

Thus:

$$40,000,000,000 = 10,000,000,000 + a$$

$$30,000,000,000 = a$$

The correct answer is E.

89. What is the unit digit of  $7^{86}$ ?

- (A) 0  
(B) 1  
(C) 3  
(D) 7  
(E) 9

The units digits of 7 to positive integers create a repeating pattern (this works for digits other than 7 also). By multiplying 7 by itself repeatedly in the calculator, you can generate the pattern:

$$7^1 = 7$$

$$7^2 = 49$$

$$7^3 = 343$$

$$7^4 = 2,401$$

$$7^5 = 16,807$$

$$7^6 = 117,649$$

$$7^7 = 823,543$$

$$7^8 = 5,764,801$$

Pattern: 7, 9, 3, 1

To find the 86<sup>th</sup> item in a pattern of 4 repeating items, find the remainder when 86 is divided by 4, that is, 2. The second element in the pattern is 9.

The correct answer is E.

90. What minimum number must be subtracted from 247 so that the number is divisible by both 6 and 7?

- (A) 35  
(B) 36  
(C) 37  
(D) 38  
(E) 39

LCM of 6 and 7 is 42.

We need to find out a multiple of 42 closest to 247.

$42 \times 5$ , that is, 210 is the multiple of 42 closest to 247 and so the value to be subtracted from 247 so that the number left is completely divisible by both 6 and 7 =  $247 - 210 = 37$ .

The correct answer is C.

91. A man can row at 5 km/h in still water. If the speed of the stream is 1 km/h and it takes 1 h to row to a place and come back, how far is the place?

(A) 2.4 km  
(B) 2.5 km  
(C) 3 km  
(D) 3.6 km  
(E) 4.2 km

Let the place be  $d$  kilometers away. Then

$$\begin{aligned}\frac{d}{6} + \frac{d}{4} &= 1 \\ \Rightarrow \frac{(2d + 3d)}{12} &= 1 \\ \Rightarrow d &= 2.4 \text{ km}\end{aligned}$$

The correct answer is A.

92. The price of an item goes down by 9% whereas the sales of the item goes up by 12%. The net effect on revenue is: (*Real NMAT Question*)

(A) 1% loss  
(B) 1% gain  
(C) 1.92% loss  
(D) 1.92% gain  
(E) Cannot be determined

Let the initial price be Rs. 10 and initial sales be 10 units.

Therefore, initial revenue = Rs. 100

New revenue = Rs. 101.92

Therefore, revenue increases by 1.92%

The correct answer is D.

93. There are 20 seats on a bus with the price of each ticket being Rs. 100. Because of inflation, the price of a ticket is increased by 10%, but in trying to provide better facilities the numbers of seats have to be decreased by 10%. What is the percentage change in the overall collection per trip before and after the change assuming all seats are being occupied?

(A) increased by 1%  
(B) decreased by 1%

(C) decreased by 3%  
(D) increased by 3%  
(E) decreased by 10%

First, let us look at this problem using the basic approach.

Initial number of seats = 20.

Initial price per ticket = Rs. 100.

Initial collection per trip =  $20 \times 100 = \text{Rs. } 2,000$ .

Revised number of seats =  $20 \times 0.9 = 18$  seats.

Revised price per ticket =  $100 \times 1.1 = \text{Rs. } 110$ .

Revised collection per trip =  $18 \times 110 = \text{Rs. } 1,980$ .

Percentage change in collection =

$$\frac{1980 - 2000}{2000} \times 100 = -1\%$$

The minus sign here indicates that the total collection has gone down by 1%.

The correct answer is B.

94. It costs a certain chair manufacturing unit Rs. 11,000 to operate for one month, plus Rs. 300 for each chair produced during the month. Each of the chairs sells for a retail price of Rs. 700. What is the minimum number of chairs that the manufacturing unit must sell in one month to make a profit?

(A) 26  
(B) 27  
(C) 28  
(D) 29  
(E) 30

Let  $b$  equal the number of chairs sold. Each chair sells for Rs. 700, so the total revenue is Rs.  $700b$ . The cost is equal to 11,000 plus 300 for every chair sold.

$$(700b) - (11,000 + 300b) > 0$$

$$700b - 11,000 - 300b > 0$$

$$400b - 11,000 > 0$$

$$400b > 11,000$$

$$b > 27.5$$

If  $b$  must be greater than 27.5, then the manufacturing unit needs to sell at least 28 chairs to make a profit.

The correct answer is C.

95. A ski resort has enough wood to keep 20 rooms heated for 14 days. If the resort decides to save wood by turning off the heat in 5 unoccupied rooms, and each room requires the same amount of wood

to heat it, how many extra FULL days will the wood supply last?

- (A) 3
- (B) 4
- (C) 5
- (D) 18
- (E) 19

The resort has  $20(14) = 280$  of wood.

If the resort only needs to heat 15 rooms instead of 20, divide 280 by 15 to get 18.666.... You are asked for FULL days, so round down to get 18.

The correct answer is D.

96. The total surface area of a solid hemisphere is 1,848  $\text{cm}^2$ . What is the circumference of its circular base? (Real NMAT Question)

- (A) 14 cm
- (B) 22 cm
- (C) 34 cm
- (D) 44 cm
- (E) 88 cm

Total surface area of a solid hemisphere =  $3\pi r^2$   
 $3\pi r^2 = 1848$

Therefore,  $r = 14$  cm

Circumference of circular base of the hemisphere =

$$2\pi r = 2 \times \frac{22}{7} \times 14 = 88 \text{ cm}$$

The correct answer is E.

97. Three people sit down to eat 14 pieces of cake. If two of the people eat the same number of pieces, and the third person eats two more pieces than each of the other two, how many pieces are eaten by the third person?

- (A) 3
- (B) 4
- (C) 5
- (D) 6
- (E) 7

Let the number of pieces of cake eaten by each of the two people who eat the same quantity be  $P$  and the number of pieces of cake eaten by the third person be  $T$ .

According to the question:

$$P + P + (P + 2) = 14$$

$$\Rightarrow 3P + 2 = 14$$

$$\Rightarrow 3P = 12$$

$$\Rightarrow P = 4$$

You can use the value of  $P$  to solve for  $T$ :

Therefore, the number of pieces eaten by the third person =  $4 + 2 = 6$

The correct answer is D.

98. A person travels from his home to his office every day covering the same distance. If he has to decrease the time taken today by 6.66%, by what percentage should the speed be increased?

- (A) 7.14%
- (B) 8.24%
- (C) 9.33%
- (D) 10.22%
- (E) 11.34%

We know that 6.66% is the percentage equivalent of

$$\frac{1}{15}$$

For constant distance, speed and time taken are inversely proportional.

	Initial	Final
Time	15	14
Speed	14	15

$$\text{Percentage change in speed} = \frac{15-14}{14} \times 100 = 7.14\%$$

The correct answer is A.

99. There are a number of beads of three different colours: red, blue and yellow, and each colour has a different value. If the value of a red bead plus a blue bead is 4.25, the value of a blue bead plus a yellow bead is 2.75, and the value of a red bead plus a yellow bead is 4.5, what is the value of a red bead plus a yellow bead?

- (A) 0.25
- (B) 2
- (C) 2.25
- (D) 2.75
- (E) 3

Suppose the value of the red beads, the blue beads and the yellow beads are  $r$ ,  $b$  and  $y$  respectively.

From the question,

$$r + b = 4.25$$

$$b + y = 2.75$$

Year	Public Sector					Private Sector		Total
	Central Govt	State Govt	Quasi Govt		Local Bodies	Large Estt.	Small Estt.	
			Central	State				
2005	2,938.5	7,201.9	3,284.7	2,463.6	2,117.9	7,489.1	962.7	26,458.4
2006	2,860.0	7,300.0	3,469.0	2,440.0	211.0	7,804.0	1,001.1	26,992.0
2007	2,800.0	7,209.9	3,447.0	2,414.0	2,132.0	8,229.0	1,046.0	27,277.0
2008	2,739.0	7,171.0	3,389.0	2,407.0	1,968.0	8,832.0	1,043.0	27,549.0

$$r + b + y = 4.5$$

You need to find out 'r+y'

If  $r + b = 4.25$ , then  $r + b + y = 4.5$  could be rewritten as:

$$4.25 + y = 4.5$$

$$y = 0.25$$

Since  $b + y = 2.75$  and  $y = 0.25$ :

$$b + 0.25 = 2.75$$

$$b = 2.5$$

Since  $r + b = 4.25$  and  $b = 2.5$ :

$$r + 2.5 = 4.25$$

$$r = 1.75$$

Therefore,  $r + y = 1.75 + 0.25 = 2$ .

The correct answer is B.

**Directions for Questions 100–103:** Answer the questions on the basis of the table given above.

**(Real NMAT Question).**

The table shows the number of people employed in the public and private sector in a country in the years 2005, 2006, 2007 and 2008. All the values are in '000.

100. What is the difference of yearly growth rate in employment between 2006–2007 and 2007–2008?

- (A) 0.0002  
(B) 0.0003  
(C) 0.0006  
(D) 0.0007  
(E) 0.0009

Yearly growth rate in employment between 2006–

$$2007 = \left( \frac{27,277,000 - 26,992,000}{26,992,000} \right) = \frac{2,85,000}{26,992,000}$$

$$= 0.0105586840545347 = 0.0106$$

Yearly growth rate in employment between 2007–

$$2008 = \left( \frac{27,549,000 - 27,277,000}{27,277,000} \right) = \frac{2,72,000}{27,277,000}$$

$$= 0.009971771089196 = 0.0100$$

Required difference = 0.0006

The correct answer is C.

101. What percentage of the total employment did the private sector contribute in 2006?

- (A) 31.9%  
(B) 32.2%  
(C) 32.3%  
(D) 32.6%  
(E) 32.7%

Total employment of year 2006 = 26,992

Contribution of private sector =  $(7,804.0 + 1,001.1)$   
= 8,805.1

$$\text{Required percentage} = \frac{8,805.1}{26,992} \times 100 = 32.62\% = 32.6\%$$

The correct answer is D.

102. What percentage of the total employment did the public sector contribute in 2007?

- (A) 64.9%  
(B) 65.2%  
(C) 66.0%  
(D) 66.2%  
(E) 66.7%

Total employment in 2007 = 27,277

Contribution of public sector =  $2,800.0 + 7,209.9 + 3,447.0 + 2,414.0 + 2,132.0$  = 18,002.9

$$\text{Required percentage} = \frac{18,002.9}{27,277} \times 100 = 66.0\%$$

The correct answer is C.

103. What was the ratio of private sector employment to public sector employment in 2008?

(A) 14 : 25  
(B) 14 : 23  
(C) 7 : 11  
(D) 2 : 31  
(E) 7 : 10

Private sector employment in 2008 = 8,832.0 + 1,043.0 = 9,875.0

Public sector employment in 2008 = 2,739.0 + 7,171.0 + 3,389.0 + 2,407.0 + 1,968.0 = 17,674.0

Required ratio = 9,875.0 : 17,674.0 = 14 : 25

The correct answer is A.

104. The Simple interest for 10 years is Rs. 6,000. The Compound interest for 2 years is Rs. 1,400. Find the rate percentage and the principal.

(A) 33.33%, 1,600  
(B) 30%, 1,800  
(C) 33.33%, 1,800  
(D) 66.66%, 1,600  
(E) 35%, 1,500

SI for 10 years is Rs. 6,000. Therefore,

SI for 1 year will be Rs. 600.

SI for 2 years will be Rs. 1,200.

CI for 2 years is Rs. 1,400.

Difference = Rs. 200. This is because of interest received on the first period's interest. Therefore,

$$200 = 600 \times \frac{R}{100}$$

Therefore,

$$R = \frac{200}{6} = 33.33\%$$

Also, interest for the first period is Rs. 600, rate is 33.33% and time period is 1 year. Therefore,

$$600 = \frac{P \times 33.33 \times 1}{100} \Rightarrow P = \text{Rs. } 1,800$$

The correct answer is C.

105. A and B can do a work in 20 and 25 days, respectively. With the help of C and D, they finish the same work in 5 days. If the efficiency of C is half that of A, find the total time taken by D to finish the work alone.

(A)  $\frac{100}{17}$

(B) 12

(C)  $\frac{200}{17}$

(D) 15

(E) 20

Let the total work be 100 units.

Total work 100 units

A: 20 days 5 units/day

B: 25 days 4 units/day

A + B + C + D: 5 days 20 units/day

It means C and D can do 11 units per day. Since the efficiency of C is half of A, C will be able to do 2.5 units per day. It means D would be doing the remaining 8.5 units per day.

Total time taken by D to finish the work alone =

$$\frac{100}{8.5} = \frac{200}{17} \text{ days.}$$

The correct answer is C.

106. A pipe can fill a tank alone in 12 h while a leak can empty it in 16 h. If the efficiency of the pipe is increased by 25% while that of the leak is halved, find the time taken to fill 75% of the tank.

(A)  $\frac{36}{7}$  h

(B)  $\frac{60}{7}$  h

(C)  $\frac{48}{7}$  h

(D)  $\frac{72}{7}$  h

(E)  $\frac{83}{7}$  h

Let the total work be 48 units.

Total work 48 units

Pipe: 12 h 4 units/h

Leak: 16 h 3 units/h

New efficiency of the pipe = 5 units.

New efficiency of the leak = 1.5 units.

Effective efficiency = 5 - 1.5 = 3.5 units.

75% of the tank has to be filled =  $\frac{3}{4}$  of 48 = 36 units.

$$\text{Time required} = \frac{36}{3.5} = \frac{72}{7} \text{ h.}$$

The correct answer is D.

107. National Cricket Academy offers two different pricing packages for cricket coaching. Under the 'Regular' pricing plan, classes can be bought for a flat rate of Rs. 80 per hour. Under the 'Exclusive' pricing plan, after paying an initial fee of Rs. 495, classes can be availed for a rate of Rs. 15 per hour. If Karan buys the 'Exclusive' pricing plan, how many classes does he need to take in order to have spent exactly 40% less than he would have under the 'Regular' plan?

(A) 10  
(B) 12  
(C) 15  
(D) 18  
(E) 20

Let us consider,

$E$  = price under the 'Exclusive' plan

$R$  = price under the 'Regular' plan

$x$  = the number of classes Karan takes

Then,

$$E = 495 + 15x$$

$$R = 80x$$

$$0.6R = E$$

Now, solving the above equations by substitution:

$$0.6R = 495 + 15x$$

$$0.6(80x) = 495 + 15x$$

$$48x = 495 + 15x$$

$$33x = 495$$

$$x = 15$$

The correct answer is C.

108. Three boys can do the same work as one woman. If a work is completed by 36 boys in 28 days working 9 h every day, how many women must be required to complete the same work in 7 days working 6 h every day?

(A) 36 women  
(B) 48 women  
(C) 54 women  
(D) 66 women  
(E) 72 women

Given that 36 boys will be equivalent to 12 women.

$$12 \text{ women} \times 28 \text{ days} \times 9 \text{ h} = y \text{ women} \times 7 \text{ days} \times 6 \text{ h}$$

$$y = 72 \text{ women}$$

The correct answer is E.

109. If the two hands of an incorrect clock coincide after every 67 min, how many minutes does the incorrect clock lose in a day?

(A) 32.21 min  
(B) 33.11 min  
(C) 33.21 min  
(D) 34.11 min  
(E) 34.31 min

Required value,

$$\left[ \frac{67 - \left( \frac{720}{11} \right)}{67} \right] \times 60 \times 24 = 33.21 \text{ min}$$

The correct answer is C.

110. Machines X and Y pack books continuously, each working at a constant rate, but Machine Y works 50% faster than Machine X. If Machine Y packs 48,000 more books in a 24-hour period than Machine X does, what is Machine X's packing rate in books per hour?

(A) 4,000  
(B) 6,000  
(C) 8,000  
(D) 12,000  
(E) 16,000

Machine Y's work in a 24-hour period exceeds Machine X's work by 48,000.

Let Machine X's packing rate in books per hour be  $a$

That is to say:

$$36a - 24a = 48,000$$

$$12a = 48,000$$

$$a = 4,000$$

Machine X packs 4,000 books per hour.

The correct answer is A.

111. A warehouse stores 345 litres of HCl, 120 litres of  $\text{H}_2\text{SO}_4$  and 225 litres of  $\text{NH}_3$ . What is the biggest size of the cask in which the acids can be stored? (Real NMAT Question)

(A) 10 litres  
(B) 15 litres  
(C) 25 litres  
(D) 35 litres  
(E) 40 litres



The biggest size of the casks in which the acids can be stored is the same as the HCF of 345, 120 and 225.

The three numbers expressed in terms of their prime factors are as follows:

$$345 = 3 \times 5 \times 23$$

$$120 = 2^3 \times 3 \times 5$$

$$225 = 3 \times 3 \times 5 \times 5$$

Prime factors common to all three numbers are 3 and 5.

3 is the factor with least power for 3 and 5 is the factor with least power for 5.

$$\Rightarrow \text{HCF} = 3 \times 5 = 15$$

Therefore, the biggest size of the casks in which the acids can be stored is 15 litres.

**The correct answer is B.**

112. At what time between 7 and 8 pm will the angle between the minute and hour hands of a clock be equal to half the angle between the minute and hour hands of a clock at 7 pm?

- (A) 7 min past 7 pm
- (B) 12 min past 7 pm
- (C) 15 min past 7 pm
- (D) 17 min past 7 pm
- (E) 19 min past 7 pm

At 7 pm, the angle between the two hands is  $210^\circ$ . This has to become half of its value, that is,  $105^\circ$ . That is, the minute hand has to cover  $105^\circ$  more than the hour hand.

The minute hand covers  $5.5^\circ$  more per minute. Therefore, to cover  $105^\circ$ , extra time required is

$$\frac{105}{5.5} = \frac{1050}{55} = \frac{210}{11} = 19 \text{ min past 7 pm}$$

**The correct answer is E.**

113. The height of a person is directly proportional to the square root of his age. At the age of 16, his height is 4 ft. What will be the height of the person when he is 25 years old?

- (A) 4.25 ft.
- (B) 4.75 ft
- (C) 5 ft.
- (D) 5.5 ft.
- (E) 6 ft.

It is given that the height is directly proportional to the square root of the age. Therefore,

$$4 = K \times \sqrt{16} \Rightarrow K = 1$$

$$\text{Now, } h = K \times \sqrt{25} \Rightarrow h = 5 \text{ ft}$$

**The correct answer is C.**

114. If 31 March 2017 is a Saturday, find the day of the week on 1 January 2014.

- (A) Wednesday
- (B) Friday
- (C) Thursday
- (D) Monday
- (E) Tuesday

The day of the week on 1 January 2014 can be determined as:

31 March 2017 is a Saturday.

31 March 2016 will be a Friday.

31 March 2015 will be a Wednesday.

31 March 2014 will be a Tuesday.

3 March 2014 (28 days before) will be a Tuesday.

28 February 2014 will be a Saturday.

31 January 2014 will be a Saturday.

3 January 2014 will be a Saturday.

So, 1 January 2014 will be a Thursday.

**The correct answer is C.**

115. A number when divided successively by 5 and 2 gives remainders of 3 and 1, respectively. What will be the remainder when the largest such two-digit number is divided by 12? (Real NMAT Question)

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

Successive division by 5 and 2 means that first the number is divided by 5 and then the resulting quotient is divided by 2.

The smallest number which satisfies this condition is 18 as, when it is divided by 5 we get quotient and remainder both 3 and when as successive division the quotient 3 is divided by 2 we get 1.

Now all possible numbers which satisfy this condition are

(Multiples of LCM of 5 and 2) + 18

Multiples of 10 + 18

Largest such 2-digit number could be

$$98(8 \times 10 + 18)$$

When 98 is divided by 12 we get 2 as remainder.

The correct answer is B.

116. A bus started driving towards the North from point X, travelling at a constant rate of 40 km per hour. An hour later, a truck started driving towards the North from the same point X at a constant rate of 30 km per hour. If each vehicle started with 8 litres of diesel, that was consumed at a rate of 30 km per litre, how many kilometres apart were the two vehicles when the bus ran out of fuel?

- (A) 30  
(B) 60  
(C) 90  
(D) 120  
(E) 150

Since the limiting factor in this case is the bus' fuel supply, we must calculate how far the bus is able to drive before running out of diesel. That is,

$$30 \text{ km per litre} \times 8 \text{ litres} = 240 \text{ km}$$

So the bus will end up 240 km to the north of its

starting point, which happens  $\frac{240}{40} = 6$  hours after it started.

The truck started an hour later and thus travelled  $(30 \text{ km per hour})(6 \text{ hours} - 1 \text{ hour}) = 150 \text{ km}$  by that time.

Therefore the two vehicles were  $240 - 150 = 90 \text{ km}$  apart when the bus ran out of fuel.

The correct answer is C.

117. Working alone at their respective constant rates, Ajay can complete a certain job in 4 hours, while Firoz can do the same job in 3 hours. Ajay and Firoz worked together on the job and completed it in 2 hours, but while Ajay worked this entire time, Firoz worked for some of the time and took 3 breaks of equal length. How many minutes long were each of Firoz' breaks?

- (A) 5 minutes  
(B) 10 minutes  
(C) 15 minutes  
(D) 20 minutes  
(E) 25 minutes

Ajay and Firoz' combined rate  $= \frac{1}{4} + \frac{1}{3} = \frac{7}{12}$   
So, in 2 hours, they should have completed  $\frac{14}{12} = \frac{7}{6}$  of the job.

Therefore, Firoz' breaks cost them  $\frac{7}{6} - 1 = \frac{1}{6}$  job worth of productivity.

Thus, Firoz' break time = the amount of time it would

have taken him to do  $\frac{1}{6}$  of the job = 30 minutes

Therefore, each of his 3 breaks was

$$\frac{30 \text{ minutes}}{3} = 10 \text{ minutes long.}$$

The correct answer is B.

118. A truck uses 10 km/litre of petrol when it is unloaded. When the truck is loaded, it travels only 80% as far on a litre of petrol as when unloaded. How many litres will the loaded truck use to travel 80 km? (*Real NMAT Question*)

- (A) 4 litres  
(B) 6 litres  
(C) 7 litres  
(D) 8 litres  
(E) 10 litres

Distance travelled by the truck on 1 litre of petrol, when unloaded = 10 km

As it travels only 80% as far on 1 litre of petrol as when unloaded,

Therefore, distance travelled by the truck on 1 litre of petrol, when loaded  $= \frac{80}{100} \times 10 \times 10 = 8 \text{ km}$

In other words, quantity of petrol used by the loaded truck to travel 8 km = 1 litre

Thus, quantity of petrol used by the loaded truck to travel 80 km  $= 1 \times 10 = 10 \text{ litres}$

The correct answer is E.

119. In colony A, there are 12 houses with an average of 4 members per house, while in colony B, there are 20 houses with an average of Y members per house. If the two colonies together have an average of 3.5 members per house, find Y.

- (A) 3.2  
(B) 3.6  
(C) 4.8  
(D) 5.4  
(E) 6.2

It is given that the average number of members in the two colonies together is 3.5. Therefore,

$$12 \times 4 + 20 \times Y = 32 \times 3.5$$

$$48 + 20Y = 112$$

$$20Y = 64$$

$$Y = 3.2 \text{ members per house}$$

The correct answer is A.

120. Three years ago, the ratio of the ages of a father and a son was 6:1. After 3 years, the ratio will be 36:11. Find the present age of the son.

- (A) 3 years  
(B) 5 years  
(C) 8 years  
(D) 11 years  
(E) 17 years

Let the ages of father and son three years ago be  $6x$  and  $x$ . Today their ages will be  $6x + 3$  and  $x + 3$  and after 3 years their ages will be  $6x + 6$  and  $x + 6$ .

Now,

$$\frac{6x+6}{x+6} = \frac{36}{11}$$

$$\Rightarrow \frac{x+1}{x+6} = \frac{6}{11}$$

$$\Rightarrow 5x = 25$$

$$\Rightarrow x = 5$$

Present age of the son will be  $x + 3$ , that is,  $5 + 3 = 8$  years.

The correct answer is C.

121. A man rows a distance of 4 km in 1 hour in still water and in 45 minutes with the current. How much time would he take to row 10 km with the current and return to the starting point? (Real NMAT Question)

- (A) 2 hr 17.5 min  
(B) 3 hr 47.5 min  
(C) 4 hr 27.5 min  
(D) 5 hr 37.5 min  
(E) 6 hr 39 min

$$\text{Speed in still water} = \frac{4}{1} = 4 \text{ km/h}$$

Speed with the stream

$$\frac{4}{\left(\frac{3}{4}\right)} = \frac{16}{3} \text{ km/h}$$

$$\text{Speed of water current} = \left(\frac{16}{3}\right) - 4 = \frac{4}{3}$$

$$\text{Speed against the stream} = 4 - \left(\frac{4}{3}\right) = \frac{8}{3}$$

Hence, time taken to travel 10 km and back

$$= \frac{10}{\left(\frac{16}{3}\right)} + \frac{10}{\left(\frac{8}{3}\right)} = \frac{30}{16} + \frac{30}{8} = \frac{90}{16}$$

$$= 5 \text{ h } 37.5 \text{ min}$$

The correct answer is D.

122. Arvind sells clothes at a roadside market for which he pays Rs. 150 per day to rent a table plus Rs. 10 per hour to his salesman. He sells an average of Rs. 78 worth of clothes per hour. Assuming no other costs, which of the functions below best represents profit per day  $P$  in terms of hours  $h$  that Arvind works for?

- (A)  $P(h) = 238 - 10h$   
(B)  $P(h) = 72 - 10h$   
(C)  $P(h) = 68h - 150$   
(D)  $P(h) = 78h - 160$   
(E)  $P(h) = -160h + 78$

Arvind's per hour sale = Rs. 78

Amount paid to the salesman per hour = Rs. 10

Therefore, the profit per hour = Rs. 68

Also, the amount paid for the roadside market per day = Rs. 150

So, the formula for his daily profit will be

Profit = Revenue - Expenses

$$P(h) = 68h - 150$$

The correct answer is C.

123. The price of two cups, seven pans and four saucers is Rs. 110 while of one cup and two saucers is Rs. 20. Find the price of three pans.

- (A) 30  
(B) 40  
(C) 60  
(D) 70  
(E) 80

As per the problem:

$$2x + 7y + 4z = 110$$

Also,

$$2x + 4z = 40$$

Therefore,

$$7y = 70 \text{ or } y = 10$$

Price of three pans will be Rs. 30.

The correct answer is A.

124. What is the highest power of 2 in the expression  $(2^{10} - 1)!$ ? (Real NMAT Question)

(A)  $2^5 - 1$   
 (B)  $2^7 - 6$   
 (C)  $2^8 - 9$   
 (D)  $2^9 - 10$   
 (E)  $2^{10} - 11$

Highest power of 2 in the expression  $(2^{10} - 1)!$

$$= \left[ \frac{2^{10}-1}{2} \right] + \left[ \frac{2^{10}-1}{2^2} \right] + \left[ \frac{2^{10}-1}{2^3} \right] + \dots + \left[ \frac{2^{10}-1}{2^9} \right]$$

$$= (2^9 - 1) + (2^8 - 1) + (2^7 - 1) + \dots + (2 - 1)$$

$$= (2^9 + 2^8 + 2^7 + \dots + 2) - 9$$

$$= \frac{2(2^9 - 1)}{2 - 1} - 9$$

$$= 2^{10} - 11$$

The correct answer is E.

125. In a college dramatics team, the ratio of boys to girls is 6 : 7. If there are 2 more girls than boys in the team, how many boys are in the team?

(A) 12  
 (B) 18  
 (C) 24  
 (D) 30  
 (E) 36

The ratio of boys to girls is 6 : 7. If you introduce the unknown multiplier  $x$ , the number of boys is  $6x$ , and the number of girls is  $7x$ , where  $x$  is a positive integer.

According to the question,

$$7x - 6x = 2$$

$$\text{or, } x = 2$$

Finally, substitute the value of  $x$  into the expression for the number of boys:  $6x = 6(2) = 12$ . There are 12 boys on the team.

The correct answer is A.

126. Three solutions having milk and water in the ratio 2:3, 3:1 and 4:5, respectively, were mixed in the ratio 2:3:4. Find the ratio of milk to water in the resultant mixture.

(A) 869:751  
 (B) 219:341  
 (C) 420:519  
 (D) 531:622  
 (E) 640:729

Let the solutions added be 2, 3 and 4 L, respectively.

Quantity of milk in the solution

$$= 2 \times \frac{2}{5} + 3 \times \frac{3}{4} + 4 \times \frac{4}{9}$$

$$= \frac{4}{5} + \frac{9}{4} + \frac{16}{9}$$

$$= \frac{144 + 405 + 320}{180}$$

$$= \frac{869}{180}$$

Quantity of water

$$= 9 - \frac{869}{180}$$

$$= \frac{1620 - 869}{180}$$

$$= \frac{751}{180}$$

Ratio of milk to water = 869:751.

The correct answer is A.

127. A certain number of teams participated in a charity Rugby tournament. Each team played with every other team participating in the tournament exactly once. If the number of matches played in the tournament is 120, then how many teams participated in the tournament?

(Real NMAT Question)

(A) 8  
 (B) 10  
 (C) 14  
 (D) 15  
 (E) 16

Let the number of teams that participated be  $n$ .

According to the question,

$$\frac{n(n-1)}{2} = 120$$

$$n^2 - n - 240 = 0$$

$$n^2 - 16n + 15n - 240 = 0$$

$$n(n-16) + 15(n-16) = 0$$

$$(n-16)(n+15) = 0$$

$$n = 16 \text{ (since } n \text{ can't be negative)}$$

The correct answer is E.

128. The cost price of a pencil is twice the cost price of an eraser. Reyansh purchased three times more pencils than erasers from a shop for a total price of Rs. 108. If a pencil and an eraser cost Rs. 4.5, find the number of pencils purchased by Reyansh.

- (A) 8
- (B) 10
- (C) 24
- (D) 32
- (E) 48

Cost price of a pencil and an eraser = Rs. 4.5. Also, the cost price of a pencil is twice the cost price of an eraser.

Let the cost price of the eraser be  $x$  and so the cost price of the pencil will be  $2x$ .

According to the problem,

$$3x = 4.5 \text{ or } x = \text{Rs. } 1.5$$

$$\text{Cost price of the eraser} = \text{Rs. } 1.5$$

$$\text{Cost price of the pencil} = \text{Rs. } 3.0$$

Let the number of erasers purchased be  $y$  and so the number of pencils purchased will be  $4y$ .

Therefore,

$$(4y \times 3) + (y \times 1.5) = 108$$

$$13.5y = 108$$

$$y = 8$$

$$\text{Number of pencils purchased} = 4y = 32.$$

The correct answer is D.

129. The arithmetic mean and geometric mean of the intercepts of a line in respective order equals 15 and 12. Which of the following could be the slope of the line? (Real NMAT Question)

- (A)  $-\frac{1}{8}$
- (B)  $-\frac{1}{4}$
- (C)  $\frac{1}{4}$
- (D) 2
- (E) 4

Let  $a$  and  $b$  be the intercepts of the given line.

$$\text{Or } a = 24 \text{ and } b = 6$$

The equation would become,

$$4x + y - 24 = 0 \text{ or } x + 4y - 24 = 0$$

$$\text{Slope} = -4 \text{ or } = -\frac{1}{4}$$

The correct answer is B.

130. If the sum of the roots of an equation is  $\frac{5}{3}$  times the product of the roots, find the relation between  $b$  and  $c$ .

$$(A) b = \frac{5c}{3}$$

$$(B) b = \frac{3c}{5}$$

$$(C) b = -\frac{5c}{3}$$

$$(D) b = -\frac{3c}{5}$$

$$(E) b = \frac{2c}{5}$$

For a quadratic equation,

$$\text{Sum of the roots} = -\frac{b}{a} \text{ and product of the roots} = \frac{c}{a}.$$

According to the problem,

$$\begin{aligned} -\frac{b}{a} &= \frac{5}{3} \left( \frac{c}{a} \right) \\ -3ab &= 5ac \\ b &= -\frac{5c}{3} \end{aligned}$$

The correct answer is C.

131. For a cricket match team selection, 2 batsmen, 3 bowlers, and 1 wicketkeeper are to be picked. There are 23 players available to play as batsmen, 21 other players available to play as bowlers, and 9 other players available to play as wicketkeepers. If the maximum possible number of complete sets of 6 players are formed, how many of the available players will not be on a team?

- (A) 7
- (B) 9
- (C) 11
- (D) 13
- (E) 15

To figure out the 'limiting factor', take the number of players available for each position and figure out how many sets could be formed in each case. If there were more than enough players in all the positions.

$$\begin{aligned} \text{Batsmen: } 23 \text{ players available} \div 2 \text{ players required per set} &= 11.5 \text{ sets} = 11 \text{ complete sets} \end{aligned}$$

Bowlers: 21 players available  $\div$  3 bowlers needed per set = 7 complete sets.

Wicketkeepers: 9 players available  $\div$  1 wicketkeeper needed per set = 9 complete sets.

Thus, only 7 complete sets can be formed, using all of the available bowlers and some of the other players. A total of  $7 \times 2 = 14$  batsmen are required, leaving  $23 - 14 = 9$  unused batsmen. Likewise,  $7 \times 1 = 7$  wicketkeepers are required, leaving  $9 - 7 = 2$  unused wicketkeepers. In all, there are  $9 + 2 = 11$  unused players, who will not be on any team.

The correct answer is C.

132. The population of a country increased at the rate of 6% per year. If the present population of the country is 23,452 million, what was the approximate population of the country 3 years ago?

(Real NMAT Question)

- (A) 18,765 million  
(B) 18,967 million  
(C) 19,691 million  
(D) 20,872 million  
(E) 21,432 million

Let the population 3 years back be P.

The growth rate is 6%, hence the population now should be  $P(1.06)^3$ .

So,  $P(1.06)^3 = 23,452$  million

$$P = \frac{23,452 \text{ million}}{(1.06)^3} = 19,691 \text{ million}$$

The correct answer is C.

133. Which of the following describes all possible solutions to the inequality  $|a + 4| < 7$ ?

- (A)  $a < 3$   
(B)  $a > -11$   
(C)  $3 > a > -11$   
(D)  $-11 > a > 3$   
(E)  $a > 11$  or  $a < -11$

Note the absolute value sign in the original inequality. This basically means that the solution could lie on either side of the number line. So, you will have to solve this inequality in two ways to get the entire range of solutions for a.

$$a - 4 < 7 \quad \text{or} \quad a + 4 > -7$$

So,  $a < 3$  or  $a > -11$

The correct answer is C.

134. If the fourth and ninth terms of a Harmonic Progression are  $\frac{1}{10}$  and  $\frac{1}{25}$ , then find the series.

(Real NMAT Question)

(A)  $1, \frac{1}{4}, \frac{1}{7}, \dots$

(B)  $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$

(C)  $\frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \dots$

(D)  $1, \frac{1}{3}, \frac{1}{7}, \dots$

(E) None of the above

For any Harmonic Progression,

$$T_n = \frac{1}{a + (n-1)d}$$

Using given values, we get

$$T_4 = \frac{1}{a + 3d} = \frac{1}{10} \quad \text{and} \quad T_9 = \frac{1}{a + 8d} = \frac{1}{25}$$

Therefore,  $a + 3d = 10$  and  $a + 8d = 25$

Solving both equations, we get

$a = 1$  and  $d = 3$

Given Harmonic Progression is

$$1, \frac{1}{4}, \frac{1}{7}, \dots$$

The correct answer is A.

135. A cricketer practises one hour a day from Monday to Friday. How many hours must he practise on Saturday in order to have an average (arithmetic mean) of 2 hours of practice every day for the 6-day period?

- (A) 3  
(B) 5  
(C) 7  
(D) 9  
(E) 11

Desired average number of hours = 2

Number of days = 6

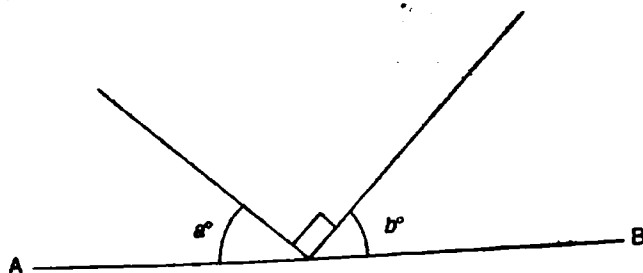
Therefore, the total number of hours the cricketer needs to practise over the six days =  $6 \times 2 = 12$  hours.

Out of this he has practised for 5 hours during the first five days of the week.

So he needs to practice for  $(12 - 5) = 7$  hours on Saturday.

The correct answer is C.

136. In the figure given what is the value of  $a + b$ ?



- (A)  $30^\circ$
- (B)  $60^\circ$
- (C)  $90^\circ$
- (D)  $100^\circ$
- (E)  $180^\circ$

Line AB is a straight line, so  $\angle a + \angle b + 90^\circ = 180^\circ$   
or  $\angle a + \angle b = 90^\circ$

The correct answer is C.

137. Two trains start from A and B and travel towards B and A, respectively. Their speeds are 80 km/h and 95 km/h, respectively. When they meet, it is found that one train has travelled 165 km more than the other. What is the distance of A to B?

- (A) 1,650 km
- (B) 1,700 km
- (C) 1,825 km
- (D) 1,890 km
- (E) 1,925 km

Let both the trains travel for  $t$  h each before meeting.

Distance covered by train A =  $80t$  and distance covered by train B =  $95t$

$$\text{Now, } 95t - 80t = 165$$

$$15t = 165 \Rightarrow t = 11 \text{ h}$$

that is, they have both travelled for 11 h before meeting.

Distance AB = Distance covered by A + Distance covered by B

$$\text{Distance AB} = 80 \times 11 + 95 \times 11 = 1,925 \text{ km}$$

The correct answer is E.

138. If  $a$ ,  $b$  and  $c$  are in arithmetic progression, then  $a + b$ ,  $b + c$ ,  $c + a$  (in any order) can be in:  
(Real NMAT Question)

- (A) arithmetic progression.
  - (B) geometric progression.
  - (C) harmonic progression.
  - (D) arithmetic or geometric progression.
  - (E) arithmetic or geometric or harmonic progression.
- If the values are the same, it can be in AP, GP, and HP.

The correct answer is E.

139. A machine can manufacture 20 pens per hour, and exactly 10 such pens fit into every box. Mahesh packs pens in boxes at a constant rate of 3 boxes per hour. If the machine ran for 2 hours and was then turned off before Mahesh started packing the pens in boxes, how many minutes would it take Mahesh to pack all the pens that the machine had made?

- (A) 40 minutes
- (B) 45 minutes
- (C) 80 minutes
- (D) 160 minutes
- (E) 800 minutes

First, figure out how many boxes worth of pens the machine produced in the 2 hours that it was on.

20 pens per hour is the rate, and 2 hours is the time.

$$\text{Work} = (20 \text{ pens per hour}) \times (2 \text{ hours}) = 40 \text{ pens}$$

Now, since there are 10 pens per box, compute the number of boxes:

$$\text{The number of boxes} = 40 \text{ pens} \times \left( \frac{1 \text{ box}}{10 \text{ pens}} \right) = 4 \text{ boxes}$$

So Mahesh must pack 4 whole boxes to accommodate all the pens that the machine had made.

Mahesh's rate is 3 boxes per hour, while the total work is 4 boxes. Rearrange and plug in:

$$\text{Time} = \left( \frac{4}{3} \right) \text{ hours}$$

$$= \frac{4}{3} \times 60 = 80 \text{ minutes}$$

The correct answer is C.

140. A can do a job in 20 days and B can do the same in 30 days. They are working on alternate days, A starting the job. In how much time will the work be completed?

- (A) 22
- (B) 24
- (C) 28
- (D) 30

(E) 34

Let the total work be 60 units.

 $A = 3$  units/day $B = 2$  units/day

Together they will be able to do 5 units in 2 days.

So, 60 units will be completed in 24 days.

In this question, the answer will not depend on who starts the work.

**The correct answer is B.**

141. This problem consists of a question and two statements, labelled (1) and (2), in which certain data are given. Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

**(Real NMAT Question)**Is  $x^2 + y^3$  odd?(1)  $x^2y = 48$ (2)  $xy^2 = 36$ 

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
 (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
 (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
 (D) EACH statement ALONE is sufficient.  
 (E) Statements (1) and (2) TOGETHER are NOT sufficient.

(1) or (2) alone can be sufficient only if  $x$  and  $y$  are natural numbers; otherwise these statements alone are not sufficient and an answer can be determined by combining both the statements. On combining (1) and (2), we get  $x = 4$  and  $y = 3$ . So,  $x^2 + y^3 = 16 + 27 = 43$  (odd).

**The correct answer is C.**

142. If the average of  $a$ ,  $b$ ,  $c$ , 5, and 6 is 6, what is the average of  $a$ ,  $b$ ,  $c$ , and 13?

- (A) 8  
 (B) 8.5  
 (C) 9  
 (D) 9.5  
 (E) 10.5

$$6 = \frac{a + b + c + 6}{5}$$

or,  $a + b + c = 19$ 

It is not necessary, or possible, to determine the values of  $a$ ,  $b$ , and  $c$  individually. The second average

includes all three variables, so the values will be summed again anyway.

$$\text{Required average} = \left( \frac{a + b + c + 13}{4} \right) = \frac{32}{4} = 8$$

**The correct answer is A.**

143. Two apples and five bananas cost Rs. 17, while three apples and four bananas cost Rs. 15. What is the price of an apple?

- (A) Rs. 1  
 (B) Rs. 1.50  
 (C) Rs. 2  
 (D) Rs. 2.50  
 (E) Rs. 3

Let price of an apple =  $X$ Price of a banana =  $Y$ 

$$\text{Now, } 2X + 5Y = 17 \quad (1)$$

$$\text{and } 3X + 4Y = 15 \quad (2)$$

Multiply Eq. (1) by 4 and Eq. (2) by 5, we get

$$8X + 20Y = 68$$

$$15X + 20Y = 75$$

Solving, we get  $X = \text{Rs. } 1$ .**The correct answer is A.**

144. A question is followed by two statements, labelled (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

**(Real NMAT Question)**What is the radius of the circle inscribed in  $\triangle ABC$ ?

- (1)  $\triangle ABC$  is a right-angled triangle with hypotenuse = 5 cm.  
 (2)  $\triangle ABC$  is an equilateral triangle with side = 6 cm.

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
 (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
 (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
 (D) EACH statement ALONE is sufficient.  
 (E) Statements (1) and (2) TOGETHER are NOT sufficient.

We know area of a triangle =  $\frac{r}{s}$  where  $r$  = radius

of incircle (that is the circle which is inscribed in

triangle) and  $s = \frac{(a + b + c)}{2}$  where  $a$ ,  $b$  and  $c$  are



sides of the triangle. So, we can find  $r$  if we know area and  $s$  for the triangle. The value of  $s$  can be obtained if we know all the sides that is  $a$ ,  $b$  and  $c$  for the triangle. So we have to find area and all the sides of the triangle.

Using statement 1 alone, we have a right triangle and we know its hypotenuse only and with this given information we can't find all the 3 sides and area. So, statement 1 alone is not sufficient

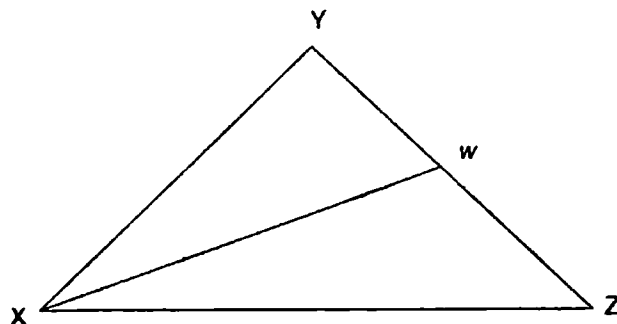
Using statement 2 alone, we have an equilateral triangle whose side is given and we know all sides must be equal. So we can find  $s$ . As area of

equilateral triangle is  $\frac{\sqrt{3}}{4}a^2$ . So, we can find area too.

So, statement 2 alone is sufficient.

The correct answer is B.

145. In the figure given, if  $XW$  bisects  $\angle X$ , and if  $\angle Y = 80^\circ$  and  $\angle Z = 60^\circ$ , what is the measure of  $\angle YXW$ ?



- (A)  $20^\circ$   
(B)  $30^\circ$   
(C)  $35^\circ$   
(D)  $40^\circ$   
(E)  $60^\circ$

$$\angle X + \angle Y + \angle Z = 180^\circ$$

$$\text{or, } \angle X + 80 + 60 = 180$$

$$\text{or, } \angle X = 40^\circ$$

$$\angle YXW = \frac{1}{2} \angle X = 20^\circ$$

The correct answer is A.

146. A question is followed by two statements, labelled (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.  
(Real NMAT Question)

Is the positive integer ' $x$ ' an even number?

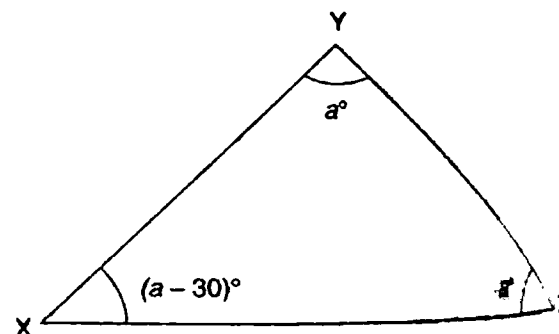
- (1)  $x$  when divided by 3 leaves a remainder of 1.  
(2)  $x$  when divided by 5 leaves a remainder of 1.  
(A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

From statement (1),  $x$  can have any value out of the following: 4, 7, 10, 13.... So, (1) is INSUFFICIENT. Similarly, from statement (2)  $x$  can have any value out of the following: 6, 11, 16, 21.... So, (2) is INSUFFICIENT.

Combining (1) and (2) also doesn't give a unique value of  $x$ . Thus, E is the correct option.

The correct answer is E.

147. In the triangle given which of the following must be true?



- (A)  $XY = YZ$   
(B)  $YZ = XZ$   
(C)  $\angle X > 50^\circ$   
(D)  $\angle Y = 50^\circ$   
(E)  $XY = XZ$

Since  $\angle Y$  and  $\angle Z$  are equal, the sides opposite to them must also be equal. Hence  $XY = XZ$ .

Since  $\angle X$  is the smallest angle in the triangle, the side opposite to it will also be the shortest. Thus,  $YZ$  is shorter than  $XY$  and  $XZ$ .

Sum of angles of a triangle =  $180^\circ$

$$\text{So, } a + a + (a - 30) = 180$$

$$3a = 210$$

$$a = 70$$

Thus,  $\angle Y = \angle Z = 70^\circ$  and  $\angle X = 70 - 30 = 40^\circ$ .

So, it is clear that option (E) is the only one that can be correct.

The correct answer is E.

148. Which of the following exponentials is the largest?  
(Real NMAT Question)

- (A)  $3^{34}$   
(B)  $5^{15}$   
(C)  $6^{16}$   
(D)  $7^{16}$   
(E)  $16^{12}$

$$9^{17} (=3^{34}) > 8^{16} (=16^{12}) > 7^{16} > 6^{16} > 5^{15}$$

Therefore,  $3^{34}$  is the largest of all the given exponentials.

The correct answer is A.

149. X cornflake is 55% fibre and Y cornflake is 70% fibre. Sharad combines a certain amount of the two cereals in a single bowl, creating a mixed cereal that is 65% fibre. If the bowl contains 120 grams of cereal, how much of the cereal, in grams, is X?

- (A) 30  
(B) 40  
(C) 60  
(D) 80  
(E) 90

Use the weighted average formula to get the ratio of X to Y:

$$\left( \frac{0.55x + 0.70y}{x + y} \right) = 0.65, \text{ where } x \text{ is the amount of}$$

X and y is the amount of Y.

$$0.55x + 0.70y = 0.65(x + y)$$

$$0.55x + 0.70y = 0.65x + 0.65y$$

$$55x + 70y = 65x + 65y$$

$$55x + 5y = 65x$$

$$5y = 10x$$

$$\text{Thus, } \frac{y}{x} = \frac{2}{1}$$

Since y and x are in a 2 to 1 ratio,  $\frac{2}{3}$  of the total is y  
and  $\frac{1}{3}$  of the total is x.

Since the total is 120 grams, X accounts for  $\frac{1}{3} \times$

$$120 = 40 \text{ grams of the mixed cereal.}$$

The correct answer is B.

150. As per a weather forecast, the probability of hail is  $\frac{1}{6}$  for any given day next week. What is the chance that there will be hail on both Thursday and Friday?

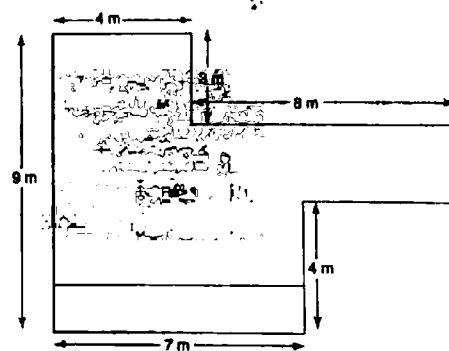
- (A)  $\frac{1}{36}$   
(B)  $\frac{1}{12}$   
(C)  $\frac{1}{6}$   
(D)  $\frac{1}{3}$   
(E)  $\frac{2}{3}$

In this case, there are two independent events: hail on Thursday and hail on Friday. The question asks about the probability that there will be hail on both the days. Hence, we simply need to multiply the individual probabilities together as follows to arrive at the answer:

$$= \frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$$

The correct answer is A.

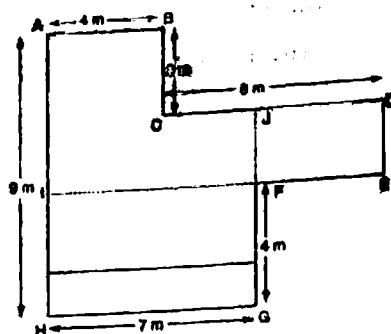
151. (Real NMAT Question)



In the adjoining plots of land shown above, all the adjacent sides are at right angles. Find the perimeter of the total land.

- (A) 40 m  
(B) 41 m  
(C) 42 m  
(D) 43 m  
(E) 44 m

Produce EF to meet AH at I and GF to meet CD at J as shown below.



Here,  $AH = BC + JF + FG$

Putting  $AH = 9$  m,  $BC = 3$  m and  $FG = 4$  m in above equation, we get

$$9 = 3 + JF + 4$$

$$\Rightarrow JF = 9 - 3 - 4 = 2 \text{ m}$$

Now,  $DE = JF = 2$  m

Also,

$$AB + CD = HG + FE$$

Putting  $AB = 4$  m,  $CD = 8$  m and  $HG = 7$  m in above equation, we get

$$4 + 8 = 7 + FE$$

$$\Rightarrow FE = 4 + 8 - 7 = 5 \text{ m}$$

Perimeter of the plot =  $AB + BC + CD + DE + EF + FG + GH + HA$

$$= 4 + 3 + 8 + 2 + 5 + 4 + 7 + 9 = 42 \text{ m}$$

The correct answer is C.

152. A 4-inch wide gold frame is placed around a rectangular photograph with dimensions 6 inches by 8 inches. What is the cost of framing this photograph if gold framing costs Rs. 100 per square inch?

- (A) 72  
(B) 176  
(C) 7,200  
(D) 17,600  
(E) 20,200

We first need to start by calculating the area of the gold frame, which is the total area of the frame + photograph minus the area of the photograph.

To get the dimensions of the frame + photograph, we need to add the width of the frame to the photograph. Since the width of the photograph is 6 in., the total width of the photograph and the frame becomes  $6 + 4 + 4 = 14$  inches (note that you will require to add the width of the frame twice, since this frame will be on both sides of the photograph). Similarly, the combined height of the frame + photograph becomes  $8 + 4 + 4 = 16$  inches.

So, Area of frame = Combined area - Area of photograph

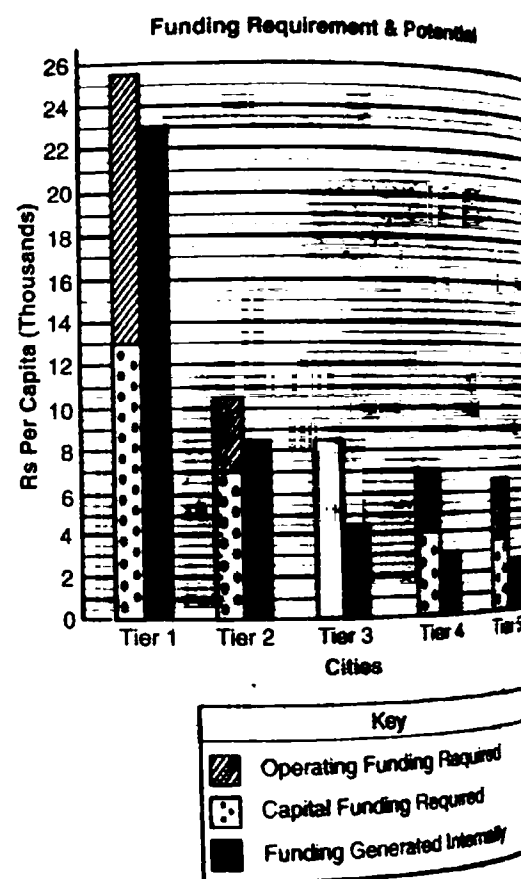
$$= (14 \times 16) - (6 \times 8)$$

$$= 224 - 48 = 176 \text{ inches}^2$$

At the rate of Rs. 100 per square inch, the total cost of making this gold frame comes to Rs.  $100 \times 176$ , Rs. 17,600.

The correct answer is D.

Directions for Questions 153–156: The graph shows the funding requirements and funding potential for various categories of cities in a country during a certain year. Some data for Tier 3 cities is missing from the graph. Go through the given graph and solve the questions based on it. (Real NMAT Question)



**Note:** Total funding requirements is the sum of operating funding and capital funding requirements.

153. What percentage of the total funding requirements of Tier 1 and Tier 2 cities combined was their capital funding requirements?

- (A) 34.6%  
(B) 42.7%  
(C) 53.5%  
(D) 55.6%

(E) 61.0%

Combined total funding requirement for Tier 1 and Tier 2 cities = Rs. 25,500 + Rs. 10,500 = Rs. 36,000

Combined capital funding requirement for Tier 1 and Tier 2 cities = Rs. 13,000 + Rs. 7,000 = Rs. 20,000

Required percentage =  $\frac{20,000}{36,000} \times 100 = 55.6\%$

The correct answer is D.

154. Which category of cities was able to meet about 53% of its required funding by way of internal funding?

(A) Tier 1  
(B) Tier 2  
(C) Tier 3  
(D) Tier 4  
(E) Tier 5

On data interpretation questions, you must be able to use visual clues to narrow down your answer choices. For example, in this question it is clear from the figure that for cities 1 and 2 the required value must be higher than 53%.

Thus, we should make our calculations for only cities 3, 4 and 5

For city 3 =  $\left(\frac{4,500}{8,500}\right) \times 100 = 53\%$

For city 4 =  $\left(\frac{300}{700}\right) \times 100 = 43\%$

For city 5 =  $\left(\frac{2,500}{6,500}\right) \times 100 = 38.5\%$

The correct answer is C.

155. The ratio of the capital funding of Tier 3 cities to the total capital funding of Tier 4 and Tier 5 cities combined was 2 : 3. What was the ratio of the capital funding to operative funding for Tier 3 cities?

(A) 8 : 7  
(B) 7 : 5  
(C) 10 : 7  
(D) 3 : 2  
(E) 5 : 3

We are not given the distribution of total funding requirement as operating and capital funding.

Requirements for Tier 3 cities: Using the given ratio of 2:3, the requirement is as follows:

Total capital funding requirement for Tier 4 and Tier 5 cities combined is = 4,000 + 3,500 = 7,500

$$\frac{\text{Capital funding for Tier 3 cities}}{\text{Capital funding for tier 4 and 5 combined}} = \frac{2}{3}$$

$$\text{Capital funding for Tier 3 cities} = \frac{(2 \times 7,500)}{3} = 5,000$$

Total funding requirement for Tier 3 cities = 8,500

Operative funding requirement for Tier 3 cities = 8,500 - 5,000 = 3,500

$$\text{Required ratio} = \frac{5,000}{3,500} = 10:7$$

The correct answer is C.

156. About 60% of the funding deficit of Tier 5 cities has to come from state governments and the remaining from the central government. If 30% of the funding from the central government comes as ad hoc grants, what is the per capita funding from central government that comes as ad hoc grants?

(A) Rs. 480 per capita  
(B) Rs. 520 per capita  
(C) Rs. 560 per capita  
(D) Rs. 590 per capita  
(E) Rs. 620 per capita

Funding deficit of Tier 5 cities = Funding requirement - Fund generated internally  
= 6,500 - 2,500 = 4,000 per capita

Funding that will come from state govt. is 60% of 4,000 per capita

Funding that will come from central govt. is 40% of 4,000 per capita = 1,600 per capita

Funding from central govt. as ad hoc grants = 30% of 1,600 per capita = Rs. 480 per capita

The correct answer is A.

157. How many five-digit numbers can be formed using the digits 5, 6, 7, 2, 9, 0 if no digits can be repeated?

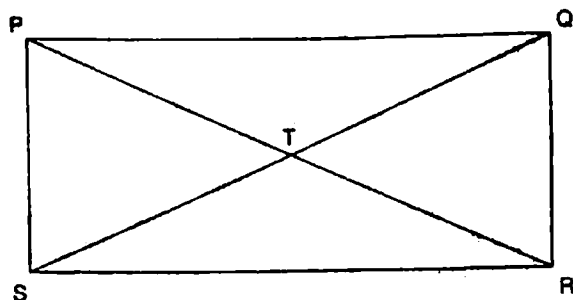
(A) 64  
(B) 120  
(C) 240  
(D) 600  
(E) 720

For the first digit, there are only five options (5, 6, 7, 8, and 9) because a five-digit number must start with a non-zero integer. For the second digit, there are 5 choices again, because now zero can be used but one of the other numbers has already been used, and numbers cannot be repeated. For the third number, there are 4 choices, for the fourth there

are 3 choices, and for the fifth number there are 2 choices. Thus, the total number of choices is  $(5)(5)(4)(3)(2) = 600$ .

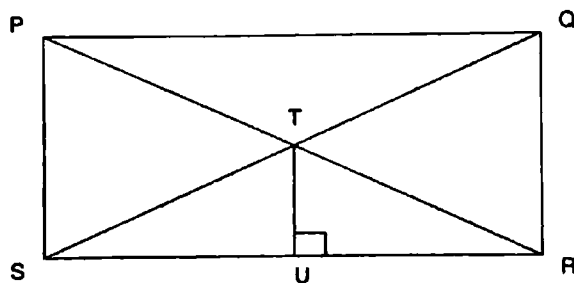
The correct answer is D.

158. In the figure given PQRS is a rectangle. If the area of  $\triangle STR$  is 20, what is the area of  $\triangle SPR$ ?



- (A) 20  
(B) 25  
(C) 30  
(D) 35  
(E) 40

Let us drop a perpendicular TU from T on the line SR.



$$\text{Area of } \triangle STR = \frac{1}{2} \times SR \times TU = 20$$

$$\text{And area of } \triangle SPR = \frac{1}{2} \times SR \times PS$$

So, the only difference between the two areas is the height TU and PS. If we can find some relation between them, we can arrive at the answer.

Now, the point of intersection of the diagonals of a rectangle also happens to be the midpoint of both its sides.

So TU is the half of PS or  $PS = 2TU$

$$\begin{aligned} \text{So, area of } \triangle SPR &= \frac{1}{2} \times SR \times (2 \times TU) \\ &= \frac{1}{2} \times SR \times TU \times 2 \\ &= 20 \times 2 = 40 \end{aligned}$$

The correct answer is E.

159. A classroom has 12 girls and 20 boys.  $\frac{1}{4}$  of the girls in the class have cell phones. If a child is selected at random from the class, what is the probability that she is a girl who does not have a cell phone?

- (A)  $\frac{3}{32}$   
(B)  $\frac{9}{32}$   
(C)  $\frac{3}{8}$   
(D)  $\frac{23}{32}$   
(E)  $\frac{29}{32}$

There are 12 girls and 20 boys in the classroom.

If  $\frac{1}{4}$  of the girls have cell phones, then there are  $12 \times \frac{1}{4} = 3$  girls with cell phones. Therefore, there

are  $12 - 3 = 9$  girls who do NOT have cell phones.

Therefore, the probability of choosing a girl who does not have a cell phone is the number of girls without cell phones divided by the total number of children,

which is  $\frac{9}{32}$

The correct answer is B.

160. In how many different ways can 10 students of a class with roll numbers from 1 to 10 be seated in a straight line such that one of the extreme positions has a student with an odd roll number while the other extreme position has a student with an even roll number?

- (A)  $48 \times 6!$   
(B)  $44 \times 12!$   
(C)  $50 \times 8!$   
(D)  $50 \times 6!$   
(E)  $52 \times 8!$

Let the first place have an odd number. This place can be filled in five ways (1, 3, 5, 7 and 9).

The other extreme position can be also filled in five ways (2, 4, 6, 8 and 10).

These two extreme positions can be interchanged also. Therefore, the two extreme positions can be first filled in

$$5 \text{ ways} \times 5 \text{ ways} \times 2 \text{ ways} = 50 \text{ ways}$$

Now, the remaining eight people can occupy eight available positions in  $8!$  ways.

$$\text{Total ways} = 50 \times 8! \text{ ways}$$

The correct answer is C.

161. What is the probability that the month of May will have five Tuesdays?

- (A)  $\frac{2}{3}$   
 (B)  $\frac{2}{5}$   
 (C)  $\frac{3}{5}$   
 (D)  $\frac{3}{7}$   
 (E)  $\frac{3}{8}$

The month of May will have 31 days which would get converted into 28 days (4 weeks) and 3 odd days.

Therefore, each of the 7 days will definitely appear 4 times. The remaining 3 days can be

- Mon, Tue, Wed
- Tue, Wed, Thu
- Wed, Thu, Fri
- Thu, Fri, Sat
- Fri, Sat, Sun
- Sat, Sun, Mon
- Sun, Mon, Tue

$$\text{Total number of cases} = 7.$$

Number of favourable cases = 3 (There are the three cases in which Tuesday appears.)

$$\text{Required probability} = \frac{3}{7}.$$

The correct answer is D.

162. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

What are the values of 3 integers  $a$ ,  $b$  and  $c$ ?  
 (Real NMAT Question)

- (1)  $ab = 8$   
 (2)  $bc = 9$

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.

- (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
 (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
 (D) EACH statement ALONE is sufficient.  
 (E) Statements (1) and (2) TOGETHER are NOT sufficient.

From statement (1), we have

$$ab = 8$$

The possible scenarios satisfying the above equation are as follows:

$$1 \times 8 = 8$$

$$2 \times 4 = 8$$

$$4 \times 2 = 8$$

$$8 \times 1 = 8$$

This information alone is not sufficient to calculate the values of  $a$ ,  $b$  and  $c$ .

From statement (2), we have

$$bc = 9$$

The possible scenarios satisfying the above equation are as follows:

$$1 \times 9 = 9$$

$$3 \times 3 = 9$$

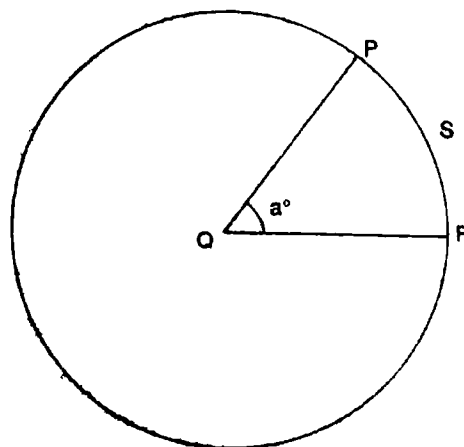
$$9 \times 1 = 9$$

This information alone is not sufficient to calculate the values of  $a$ ,  $b$  and  $c$ .

However, if we combine the information from both the statements, we get  $a = 8$ ,  $b = 1$  and  $c = 9$ .

The correct answer is C.

163. In the figure below, the ratio of the length of minor arc PSR to the circumference of the circle Q is 1:9. What is the measure of  $\angle a$ ?



- (A)  $30^\circ$   
 (B)  $40^\circ$

- (C)  $45^\circ$   
 (D)  $50^\circ$   
 (E)  $60^\circ$

Here we need to use the ratio

$$\frac{\text{Length of arc}}{\text{Circumference}} = \frac{\text{Measure of arc's central angle}}{360^\circ}$$

$$\Rightarrow \frac{1}{9} = \frac{a}{360}$$

$$\Rightarrow a = \frac{360}{9} = 40^\circ$$

The correct answer is B.

164. If  $P - Q = 1$  and  $R - S = 1$ , then which of the following is necessarily odd? (Real NMAT Question)

- (I)  $\frac{(P+Q)}{(R+S)}$   
 (II)  $\frac{(P+R)}{(Q+S)}$   
 (III)  $PR(P+Q)$   
 (IV)  $PQ + RS$

- (A) Only (I)  
 (B) (I) and (II)  
 (C) (I) and (III)  
 (D) (II) and (III)  
 (E) (I) and (IV)

As  $P - Q = 1$ , so  $P = Q + 1$

$R - S = 1$ , so  $R = S + 1$

$$(I) \frac{(P+Q)}{(R+S)} = \frac{(2Q+1)}{(2S+1)}$$

For  $Q$  to be even or odd,  $2Q$  is definitely even and so  $2Q + 1 = \text{odd}$

For  $S$  to be even or odd,  $2S$  is definitely even and so  $2S + 1 = \text{odd}$

$$\frac{\text{Odd}}{\text{Odd}} = \text{Odd}$$

$$(II) P + R = (Q + S + 2)$$

$$\text{Hence, } \frac{(P+Q)}{(R+S)} = \frac{(Q+S+2)}{(Q+S)}$$

$Q$  and  $S$  may be even or odd and in that case we can't deduce  $\frac{(P+Q)}{(R+S)}$  to be necessarily odd

(III)  $PR(P+Q) = (Q+1)(S+1)(2Q+1)$ . As here too we don't know about  $Q$  and  $S$  being even or odd, so we cannot deduce whether  $PR(P+Q)$  is necessarily odd or not.

$$(IV) PQ + RS = Q(Q+1) + S(S+1)$$

$Q(Q+1)$  and  $S(S+1)$  both are product of 2 consecutive numbers and hence must be even

As, Even + Even = Even

So,  $PQ + RS$  is necessarily even

The correct answer is A.

165. A cube has sides numbered 1 through 6. If the cube is rolled three times, what is the probability that at least one of the rolls will result in a number higher than 4?

- (A)  $\frac{13}{19}$   
 (B)  $\frac{11}{13}$   
 (C)  $\frac{14}{19}$   
 (D)  $\frac{19}{27}$   
 (E)  $\frac{12}{31}$

The probability that at least one roll results in a number higher than 4 is equal to 1 minus the probability that all three of the rolls result in numbers 4 or lower. For one roll, there are 6 possible outcomes and 4 ways in which the outcome can be 4 or lower, so the probability is  $\frac{4}{6} = \frac{2}{3}$ . Thus, the

probability that all three rolls result in numbers 4 or lower is  $\left(\frac{2}{3}\right)\left(\frac{2}{3}\right)\left(\frac{2}{3}\right) = \frac{8}{27}$ . This is the result that

you do NOT want; subtract this from 1 to get the probability that you do want:

$$\text{Therefore, the required probability} = 1 - \left(\frac{8}{27}\right) = \frac{19}{27}$$

The correct answer is D.

166. Five friends, Akshita, Binod, Chetan, Dravid, and Eshan are to be arranged in a line. How many such arrangements are possible if Binod is not allowed to stand next to Dravid?

- (A) 24  
 (B) 48  
 (C) 72  
 (D) 96  
 (E) 120

The number of ways in which the friends can be arranged with Binod and Dravid separated is equal to the total number of ways in which the friends can

be arranged minus the number of ways they can be arranged with Binod and Dravid together.

The total number of ways to arrange 5 people in a line is  $5! = 120$ .

To compute the number of ways to arrange the 5 friends such that Binod and Dravid are standing together, group Binod and Dravid as one person, since they must be lined up together. Then the problem becomes one of lining up 4 students, which gives  $4!$  possibilities.

However, remember that there are actually two options for Binod and Dravid coming together: Binod first and then Dravid or Dravid first and then Binod. Therefore, there are  $(4!)(2) = (4)(3)(2)(1)(2) = 48$  total ways in which the five friends can be lined up with Dravid and Binod standing together.

Therefore, there are  $120 - 48 = 72$  arrangements where Binod will be separated from Dravid.

The correct answer is C.

167. How many times will the digit 5 be used to write numbers from 1 to 7,700 in base 8?  
(Real NMAT Question)

(A) 1,456      (B) 2,048      (C) 2,540  
(D) 2,611      (E) 2,632

From 1 to 77, there will be 16 5's used (05, 15, 25, 35, 45, 55, 65, 75, 50, 51, 52, 53, 54, 55, 56, 57) as this is base 8.

100 to 777—Total  $16 \times 7$

Also from 500 to 577 there are additional 64 5's at hundreds place:

The numbers are as follows

500 510 520 530 540 550 560 570

501 511 521 531 541 551 561 571

502 512 522 532 542 552 562 572

503 513 523 533 543 553 563 573

504 514 524 534 544 554 564 574

505 515 525 535 545 555 565 575

506 516 526 536 546 556 566 576

507 517 527 537 547 557 567 577

Hence from 1 to 777 there are  $(16 \times 8) + 64 = 192$  5's

So we get,

$0 - 777 = 192$

$1,000 - 1,777 = 192$

$2,000 - 2,777 = 192$

$3,000 - 3,777 = 192$

$4,000 - 4,777 = 192$

$5,000 - 5,777 = 80 \times 7 + 144 = 704$

$$6,000 - 6,777 = 192$$

$$7,000 - 7,777 = 192$$

$$\text{So the total} = (192 \times 7) + 704 = 2,048$$

The correct answer is B.

168. If the radius of the base of a right circular cylinder is  $r$  and its volume is  $\left(\frac{66}{7}\right)r^2 \text{ cm}^3$ , find the height of the cylinder.

(A) 3 cm      (B) 4 cm      (C) 6 cm  
(D) 7 cm      (E) 9 cm

$$\text{Volume of a cylinder} = \pi r^2 h = 66 \times \frac{r^2}{7}$$

$$\frac{22}{7} \times r^2 \times h = \frac{66}{7} r^2$$

$$h = 3 \text{ cm}$$

The correct answer is A.

169. Pipe A can fill a tank in 5 hours, while Pipe B can empty the tank in 6 hours. If both the pipes are opened simultaneously, how much time will it take to fill the tank completely? (Real NMAT Question)

(A) 11 hr  
(B) 30 hr  
(C) 45 hr  
(D)  $\frac{11}{30}$  hr  
(E)  $2\frac{8}{11}$  hr

Work done by Pipe A per hour (efficiency of Pipe A) =  $\frac{100}{5} \% \text{ per hr} = 20\% \text{ per hr}$

Work done by Pipe B per hour (efficiency of Pipe B) =  $-\frac{100}{6} \% \text{ per hr} = -16.66\% \text{ per hr}$

(Work done by pipe B is -ve as it can empty the tank)

Work done by both operating together per hr is (combined efficiency) =  $(20 - 16.66)\% \text{ per hr} = 3.33\% \text{ per hr}$

Time needed to complete work =  $\frac{100}{3.33} \text{ hr} = 30 \text{ hr}$

The correct answer is B.



170. There is an 80% chance that Deeksha will skip her lunch and 25% chance that there will be a power failure. If these events are independent, what is the probability that Deeksha will skip her lunch OR that there will be a power failure?

(A) 20%  
(B) 80%  
(C) 85%  
(D) 95%  
(E) 105%

This question is an OR question, so you may be tempted to simply add the two probabilities. However, this will give you a number greater than 100%, which is NEVER possible:  $0.8 + 0.25 = 1.05$ . This is because this figure double-counts the cases where Deeksha skips her lunch and there is a power failure. Subtract out these cases in order to find the desired value.

In order to calculate the probability that Deeksha will skip her lunch AND that there will be a power failure, multiply the individual probabilities together:

$$0.8 \times 0.25 = 0.2$$

Then, subtract to find the required probability:

$$1.05 - 0.2 = 0.85, \text{ or } 85\%$$

The correct answer is C.

171. Raju can do a piece of work in 30 days. After working for 3 days, he takes leave and the remaining work is completed by Sunny in 27 days. Which of the following could be the time taken by Sunny to complete the work alone? (Real NMAT Question)

(A) 20 days  
(B) 27 days  
(C) 30 days  
(D) 35 days  
(E) 45 days

Efficiency of Raju =  $\frac{100}{30}$  % per day = 3.33% work per day

Work completed after 3 days =  $3 \times 3.33\% = 10\%$

Remaining work after 3 days = 90%

Sunny completed 90% work in 27 days

Efficiency of Sunny =  $\frac{90}{27}$  % work per day = 3.33% work per day

Time needed by sunny to complete entire work is =  $\frac{100}{3.33}\% = 30$  days

The correct answer is C.

Alternative solution:

Raju needs 30 days to complete the work, but left after 3 days. So, he needed 27 days more and so if Sunny needs 27 days to finish remaining work that means both Raju and Sunny have same efficiency and Sunny too must take 30 days to complete the work alone.

172. Eleven players are to be selected for a match out of an available list of 14 players. In how many ways can this be done such that the best two identified players are always selected?

(A)  ${}^{14}C_{11}$   
(B)  ${}^{12}P_9$   
(C)  ${}^{12}C_9$   
(D)  ${}^{12}C_9 \times 2!$   
(E)  ${}^{12}C_{11}$

If two people have to be definitely selected, then nine people have to be selected of the remaining 12 people =  ${}^{12}C_9$ .

The correct answer is C.

173. An online book company reported that it sold 143 eBooks for every 100 hardbacks, over a period of 6 months. If the company sold 94,500 hardbacks during that time, how many eBooks did it sell? (Real NMAT Question)

(A) 14,300  
(B) 94,643  
(C) 1,08,800  
(D) 1,35,135  
(E) 1,41,750

Over the given period of 6 months, when the company sold 100 hardbacks, 143 eBooks were sold.

Now, if the company sold 94,500 hardbacks during that time, then the number of eBooks sold =  $\frac{(94,500 \times 143)}{100} = 1,35,135$

The correct answer is D.

174. A 12 inch  $\times$  16 rectangular picture is displayed on a 18 inch  $\times$  30 inch rectangular frame. What is the area of the part of the frame not covered by the picture?

(A) 150 square inches  
(B) 244 square inches  
(C) 264 square inches  
(D) 348 square inches  
(E) 384 square inches

The area of the picture is  $12 \times 16 = 192$  square inches. The area of the frame is  $18 \times 30 = 540$  square inches.

The required area can be calculated by subtracting the area of the picture from the area of the frame.

Therefore, the required area =  $540 - 192 = 348$  square inches.

The correct answer is D.

175. What is the remainder when  $\frac{44^{63} \times 44^3}{44^{11}}$  is divided by 7? (Real NMAT Question)

- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5

$$\frac{44^{63} \times 44^3}{44^{11}} = 44^{63+3-11} = 44^{55}$$

Now we have to find the remainder when  $44^{55}$  is divided by 7

$$\frac{44^{55}}{7} = \text{remainder of } \frac{2^{55}}{7} \left( \text{as } \frac{44}{7} = \text{remainder is } 2 \right)$$

$$2^3 = 8 \text{ and } \frac{8}{7} = \text{remainder is } 1.$$

$$\frac{2^{55}}{7} = \frac{2(2)^{54}}{7} = \frac{2(8)^{18}}{7} = \frac{2(1)^{18}}{7} = \frac{2}{7} = \text{remainder is } 2$$

The correct answer is B.

176. Eight students were to be seated along two rows such that four students will be seated in each of the two rows called A and B. Two of the eight students definitely want to be seated in row A while one of them definitely wants to be seated in row B. In how many different ways can the eight students be seated?

- (A) 5,760  
(B) 5,960  
(C) 6,500  
(D) 6,760  
(E) 7,160

The two students who want to be in row A can be seated in  $4 \times 3 = 12$  ways.

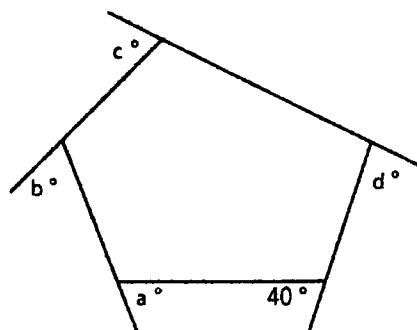
The student who wants to be in row B can be seated in four ways.

The remaining five people can be seated in  $5!$  ways = 120 ways.

Therefore, total number of ways =  $12 \times 4 \times 120 = 5,760$  ways.

The correct answer is A.

177. What is the value of  $a + b + c + d$ ?



- (A)  $240^\circ$   
(B)  $320^\circ$   
(C)  $360^\circ$   
(D)  $500^\circ$   
(E)  $540^\circ$

The interior figure shown is a pentagon, although an irregular one. The sum of the interior angles of any polygon can be determined using the formula  $(n - 2)(180)$ , where  $n$  is the number of sides:

$$(5 - 2)(180) = (3)(180) = 540$$

Using the rule that angles forming a straight line sum up to 180, the interior angles of the pentagon (starting at the top and going clockwise) are  $180 - c$ ,  $180 - d$ , 140,  $180 - a$ , and  $180 - b$ . The sum of these angles can be set equal to 540.

$$540 = (180 - c) + (180 - d) + 140 + (180 - a) + (180 - b)$$

$$540 = 140 + 4(180) - a - b - c - d$$

$$540 - 140 - 720 = -(a + b + c + d)$$

$$-320 = -(a + b + c + d)$$

$$\text{So, } a + b + c + d = 320^\circ.$$

The correct answer is B.

178. During the morning assembly in a school, all the students can stand in rows so that each row has 8, 10 or 12 students. Which of the following could be the least number of students in the school? (Real NMAT Question)

- (A) 20  
(B) 30  
(C) 60  
(D) 100  
(E) 120

Total number of students must be a multiple of LCM and as we are asked about least number of students So, required number of students is LCM of 8, 10 and 12.

$$\text{LCM of 8, 10 and 12} = \text{LCM of 23, 2, 151, 2, 231} = 2, 33, 151 = 8 \times 3 \times 5 = 120$$

The correct answer is E.

179. Mr. X wants to buy a total of 100 fruits using exactly a sum of Rs. 1,000. He can buy mango at Rs. 20 per unit, apple at Rs. 5 per unit or banana at Rs. 1 per unit. If he has to buy at least one of each fruit and cannot buy any other type of fruit, then in how many distinct ways can he make his purchase?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

Let the number of mangoes, apples and bananas purchased be A, B and C, respectively.

Thus,

$$20A + 5B + C = 1,000 \text{ and } A + B + C = 100$$

Solving the above two equations by eliminating C, we get

$$19A + 4B = 900.$$

$$\text{or, } B = \frac{900 - 19A}{4}$$

$$\text{or, } B = 225 - \frac{19}{4}A$$

Now, as B is the number of apples and  $0 < B < 99$ , so, putting these limiting values of B in the above equation will provide the value of A as  $27 < A < 47$ . Since A has to be the multiple of 4, so possible values of A are 28, 32, 36, 40 and 44.

Now, for A = 28 and 32;  $A + B > 100$ , so these values of A can be rejected.

For all other values of A, we get the desired solution:

$$A = 36, B = 54, C = 10$$

$$A = 40, B = 35, C = 25$$

$$A = 44, B = 16, C = 40$$

Thus, there are three possible solutions.

The correct answer is C.

180. A question is followed by two statements, labelled (1) and (2). Using the information provided and general knowledge, decide whether the information given is

sufficient to solve the problem.

(Real NMAT Question)

Is the mean of Set A greater than the mean of Set B?

Set A = {5, 15, x, 12, 14};  $x > 0$

Set B = {y, 7, 13, 8, 18};  $y > 0$

- (1)  $x = y$
- (2) Median of Set A > Median of Set B
- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

The mean of Set A is  $\frac{46+x}{5}$  and the mean of Set B is  $\frac{46+y}{5}$

Using Statement (1) alone, we can conclude that when  $x = y$ , the mean of Set A is equal to the mean of Set B.

However, Statement (2) alone does not provide sufficient information to answer the question.

The correct answer is A.

181. A solid cube with side length of 2 feet is cut into 2 inch x 2 inch x 4 inch cuboids. What is the ratio of the total surface area of all the resulting cuboids to the surface area of the original cube? (1 foot = 12 inches)

- (A) 2 : 1
- (B) 4 : 1
- (C) 5 : 1
- (D) 8 : 1
- (E) 10 : 1

The surface area of the original cube is  $6 \times (24)^2 = 3,456$  square inches.

(As 1 foot = 12 inches)

To cut the large cube into 2 inch x 2 inch x 4 inch cuboids, two dimensions (say length and width) will be sliced every 2 inches, while one dimension (say height) will be sliced every 4 inches. Thus,

$$\left(\frac{24}{2}\right) \times \left(\frac{24}{2}\right) \times \left(\frac{24}{4}\right) = 864 \text{ cuboids can be cut from the large cube.}$$

The equation for the surface area of a cuboid is:

$\frac{2}{w} + 2wh + \frac{2}{h}$ . In this case, that is  $2(2 \times 2) + 2(2 \times 4) + 2(2 \times 4) = 8 + 16 + 16 = 40$  square inches per cuboid.

Since there are 864 cuboids, the total surface area is:

$40 \times 864 = 34,560$  square inches.

Finally, the ratio of the total surface area of all the cuboids to the surface area of the original cube is

$$= \frac{34,560}{3,456} = 10:1$$

The correct answer is E.

182. A sector of a circle having radius of 4 units has an area of  $4\pi$  square units. What is the arc length of the sector?

- (A)  $\pi$  units  
(B)  $2\pi$  units  
(C)  $4\pi$  units  
(D)  $6\pi$  units  
(E)  $8\pi$  units

The radius of the circle is 4 units, so the area of the circle is  $\pi(4)^2 = 16\pi$ . The area of the sector is

$4\pi$  units, or  $\left(\frac{4\pi}{16\pi}\right) = \frac{1}{4}$  of the circle. The radius

of the circle is 4 units, so the circumference of the

whole circle is  $2\pi(4) = 8\pi$  units. Since the sector is  $\frac{1}{4}$  of the circle, the arc length is

$$\left(\frac{1}{4}\right)(8\pi) = 2\pi \text{ units.}$$

The correct answer is B.

183. Let a right circular cylinder's radius be  $r$  and height be  $h$ . What will be the change in volume of this

cylinder if  $r$  becomes  $\frac{r}{2}$  and  $h$  becomes  $2h$ ?

- (A) 50% decrease  
(B) No change  
(C) 25% increase  
(D) 50% increase  
(E) 100% increase

According to the formula for the volume of a right circular cylinder, the original volume is  $V = \pi r^2 h$ . As per the question:

$$Y = \pi \left(\frac{r}{2}\right)(2h) = \frac{2\pi r^2 h}{2^2} = \frac{\pi r^2 h}{2}$$

Thus, the volume, which was once  $\pi r^2 h$ , is now

$\left(\frac{\pi r^2 h}{2}\right)$ . This is a 50% decrease.

The correct answer is A.

184. What is the probability that a card drawn at random from a pack of cards is either black or a jack?

- (A)  $\frac{17}{52}$   
(B)  $\frac{7}{13}$   
(C)  $\frac{27}{52}$   
(D)  $\frac{3}{13}$   
(E)  $\frac{5}{9}$

There are a total of  $(13 + 13) = 26$  black cards and 4 jacks in a pack of cards. But remember that two of these jacks are also black cards, so we will have to account for this overlap.

Therefore, number of favourable cards =  $13 + 13 + 4 - 2 = 28$ .

Total cards = 52.

$$\text{Required probability} = \frac{28}{52} = \frac{7}{13}.$$

The correct answer is B.

185. A batch of clips costs Rs.  $(p + 15)$  for a company to produce and each batch sells for Rs.  $p$  ( $9 - p$ ). For which of the following values of  $p$  does the company make a profit?

- (A) 3  
(B) 4  
(C) 5  
(D) 6  
(E) 7

We know that profit equals revenue minus cost.

Therefore, the company's profit is:

$$\begin{aligned} p(9 - p) - (p + 15) &= 9p - p^2 - p - 15 \\ &= -p^2 + 8p - 15 \\ &= -(p^2 - 8p + 15) \\ &= -(p - 5)(p - 3) \end{aligned}$$

When  $p = 5$  or  $p = 3$ , the profit becomes 0, so eliminate (A) and (C). For  $p > 5$ , the profit becomes negative (that is, the company loses money). The profit is only positive if  $(p - 5)$  and  $(p - 3)$  have opposite signs, which occurs when  $3 < p < 5$ .

The correct answer is B.

186. Bag A contains 3 white and 3 red beads. Bag B contains 6 white and 3 red beads. One of the two bags will be chosen at random, and then two beads will be drawn from that bag at random without replacement. What is the probability that the two beads drawn will be of the same colour?

- (A)  $\frac{7}{20}$   
 (B)  $\frac{9}{10}$   
 (C)  $\frac{9}{20}$   
 (D)  $\frac{11}{20}$   
 (E)  $\frac{13}{20}$

The probability of choosing Bag A,  $P(A)$ , and the probability of choosing Bag B,  $P(B)$ , must be the same, that is,  $P(A) = P(B) = \frac{1}{2}$ .

If Bag A is chosen, what is the probability of a matched pair? First, compute the probability of two whites. The

probability of the first white is  $\frac{3}{6}$  and the probability of the second white is  $\frac{2}{5}$ , so the probability of a first

AND second white is  $\left(\frac{3}{6}\right)\left(\frac{2}{5}\right) = \frac{1}{5}$ . Similarly, the

probability of two reds is  $\left(\frac{3}{6}\right)\left(\frac{2}{5}\right) = \frac{1}{5}$ . If Bag A is

chosen, you can obtain a match by either choosing a

pair of white OR a pair of red, so you must add their probabilities to get the total chance of a pair. This gives

$$P(\text{Bag A Pair}) = \frac{1}{5} + \frac{1}{5} + \frac{2}{5}.$$

Similarly, if Bag B is chosen, the probability of

a pair of white beads is  $\left(\frac{6}{9}\right)\left(\frac{5}{8}\right) = \frac{5}{12}$  and the

probability of a pair of red beads is  $\left(\frac{3}{9}\right)\left(\frac{2}{8}\right) = \frac{1}{12}$ .

Therefore, the probability of a pair is  $P(\text{Bag B pair}) = \frac{5}{12} + \frac{1}{12} = \frac{6}{12} = \frac{1}{2}$ . The probability of choosing Bag A AND a pair from Bag A is the product of the two events,  $\left(\frac{1}{2}\right)\left(\frac{2}{5}\right) = \frac{1}{5}$ .

Similarly, the probability of choosing Bag B AND a pair from Bag B is  $\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) = \frac{1}{4}$ . The total probability of choosing a pair will be the probability of choosing Bag A and a pair from Bag A OR choosing Bag B and a pair from Bag B, meaning you must sum up these two events. This gives:  $P(\text{pair})$

$$= \frac{1}{5} + \frac{1}{4} = \frac{4}{20} + \frac{5}{20} + \frac{9}{20}.$$

The correct answer is C.

187. What is the difference between the sum of all even positive integers between 1 and 100 (inclusive) and the sum of all odd positive integers between 100 and 150?

- (A) -575  
 (B) -475  
 (C) 225  
 (D) 475  
 (E) 575

Remember that when dealing with evenly spaced integers, the average is the middle value.

The sum of the even integers between 1 and 100 =  $51 \times 50 = 2550$

The sum of the odd integers between 100 and 150 =  $125 \times 25 = 3125$

The required difference =  $2550 - 3125 = -575$

The correct answer is A.

188. Two students are selected from a class of 5 girls and 12 boys. Find the probability that a particular pair of girl and boy is selected.

- (A)  $\frac{1}{136}$   
 (B)  $\frac{1}{63}$   
 (C)  $\frac{1}{51}$   
 (D)  $\frac{10}{21}$   
 (E)  $\frac{13}{61}$

Total number of possibilities =  ${}^{17}C_2$

$$= \frac{17 \times 16}{1 \times 2}$$

$$= 17 \times 8 = 136$$

Number of favourable cases = 1.

Therefore, the required probability =  $\frac{1}{136}$ .

The correct answer is A.

**Data for Questions 189–191:** Two thousand students applied for admission to the various programs at AU University. Out of the total applicants, 20% did not write the admission test. The following table gives the cumulative frequency in percentage of the mark range received by those students who appeared for the admission test.

Marks	Cumulative frequency (%)
$\leq 10$ marks	15
$\leq 20$ marks	25
$\leq 30$ marks	40
$\leq 40$ marks	60
$\leq 50$ marks	85
$\leq 60$ marks	100

189. What is the number of students who got marks in the range of 21–30 in the admission test?

- (A) 120
- (B) 240
- (C) 360
- (D) 400
- (E) 640

As per the problem, 2,000 students applied out of which 20% did not appear for the test.

Number of students who appeared = 80% of 2,000 = 1,600.

Percentage of students in the range of 21–30 marks =  $40 - 25 = 15\%$ .

Therefore, 15% of 1,600 = 240 students.

The correct answer is B.

190. If more than 40 marks are required to qualify for the next round, find the difference between the number of students who qualified for the next round and those who failed to qualify for the next round?

- (A) 160
- (B) 240

- (C) 320
- (D) 380
- (E) 420

Percentage of students who qualified for the next round = 40%.

Percentage of students who did not qualify for the next round = 60%.

Difference between the two = 20% of 1,600 = 320 students.

The correct answer is C.

191. By what percentage is the number of students in the range of 41–50 marks more than those in the range of 0–10 marks?

- (A) 10%
- (B) 20%
- (C) 30%
- (D) 33.33%
- (E) 66.66%

Percentage of students in the range of 41–50 marks = 25%.

Percentage of students in the range of 0–10 marks = 15%.

Therefore,

$$\left( \frac{25 - 15}{15} \right) \times 100 = 66.66\%$$

The correct answer is E.

192. A milkman mixes water and milk in the ratio 3 : 4. As one of his customers was not home, he had to deliver less milk. So he decided to decrease the dilution, for which he took out 5 litres of mixture and added 1 litre of milk. The ratio of water to milk then changed to 2 : 5. How many litres of mixture did he have initially? (*Real NMAT Question*)

- (A) 4
- (B) 5
- (C) 6
- (D) 7
- (E) 8

Let the value of water and milk in original mixture be  $3x$  and  $4x$ , respectively. Total mixture is  $7x$  litres

Taking out 5 litres from the mixture means

$$\frac{(4 \times 5)}{7} \text{ milk} = \frac{20}{7} \text{ litre milk is removed and } \frac{(3 \times 5)}{7}$$

$$= \frac{15}{7} \text{ litres water is removed.}$$

$$\text{Now, } \frac{\left(3x - \frac{15}{7}\right)}{\left(4x - \frac{20}{7} + 1\right)} = 2:5$$

$$\frac{(21x - 15)}{(28x - 13)} = 2:5$$

$$105x - 75 = 56x - 26$$

$$49x = 49$$

$$x = 1$$

$$\text{Original mixture} = 7x = 7 \times 1 = 7 \text{ litres.}$$

The correct answer is D.

**Data for Questions 193–195:** A person was looking at the performance data of four companies namely A, B, C and D for the year 2014. He observed that the sale of company A for the year 2014 was twice the expenses for company D in the same year. The profit for company C in the year 2014 was 25% while its sale was Rs. 300 crore. The ratio of the sales of company B and the expenses of company D was 4:5. Also, the expenses of company B were half of the total expenses of company D in the same year.

It was also observed that the sale of company D was Rs. 250 crore while its profit for the year was Rs. 150 crore. Also, the expenses of company A in the year 2014 were such that its profit was 50%.

(For the questions based on above data, consider, Profit = Sale – Expenses)

**General Explanation for Questions 193–195:**

*For company C:*

Sales of company C = Rs. 300 crore and profit = 25%.

$$\text{Therefore, Expenses} \times \left(\frac{125}{100}\right) = 300$$

Expenses = Rs. 240 crore.

*For company D:*

Sales = Rs. 250 crore

Profit = Rs. 150 crore

Expenses = 250 – 150 = Rs. 100 crore.

*For company A:*

Sales of company A in 2014 =  $2 \times 100$  = Rs. 200 crore.

Profit of company A = 50%

$$\text{Therefore, Expenses} \times \left(\frac{150}{100}\right) = 200$$

$$\text{Expenses} = \text{Rs. } \frac{400}{3} = \text{Rs. } 133.33 \text{ crore.}$$

*For company B:*

Ratio of the sales of company B to the expenses of company D = 4:5

$$\text{Therefore, sales of company B} = \frac{4}{5} \times 100 = 80$$

Sales of company B in 2014 = Rs. 80 crore

Expenses of company B in 2014 = Rs. 50 crore

Therefore, profit of company B in 2014 = Rs. 30 crore

Thus overall performance of companies can be tabulated as:

Company	Sales (in crore)	Expenses (in crore)	Profit (in crore)	Profit (%)
A	200	133.33	66.66	50
B	80	50	30	60
C	300	240	60	25
D	250	100	150	150

**193.** What is the profit percentage of company B in the year 2014?

- (A) 35%
- (B) 40%
- (C) 50%
- (D) 55%
- (E) 60%

The correct answer is E.

**194.** Find the value of profit of company A in the year 2014.

- (A) Rs. 33.33 crore
- (B) Rs. 45 crore
- (C) Rs. 50 crore
- (D) Rs. 55 crore
- (E) Rs. 66.66 crore

The correct answer is E.

**195.** Which company had the highest profit percentage in the year 2014?

- (A) A
- (B) B
- (C) C
- (D) D
- (E) Both A and D

The correct answer is D.

196. A student took a test in which 3 marks were given for each correct answer and 0.5 marks were deducted for an incorrect answer. If the test had 25 questions and the student attempted all the questions and got 40 marks in total, what is the difference between the number of correct and incorrect answers?

(A) 5  
(B) 10  
(C) 12  
(D) 15  
(E) 18

Let the number of correct answers be  $x$ ; so the number of incorrect answers will be  $25 - x$ .

According to the problem,

$$3x - 0.5(25 - x) = 40$$

$$\Rightarrow 3x - 12.5 + 0.5x = 40$$

$$\Rightarrow x = 15$$

$$\text{The number of incorrect answers} = 25 - 15 = 10$$

$$\text{The required difference} = 15 - 10 = 5$$

The correct answer is A.

197. In an exam that was taken by 75 students, 40 passed in mathematics, 50 in science while 10 failed in both the subjects. Find the percentage of people who passed in both the subjects.

(A) 25%  
(B) 33.33%  
(C) 40%  
(D) 45%  
(E) 50%

Let  $x$  be the number of students who passed in both the subjects.

As 10 students failed in both the subjects, the number of students who passed in at least one of the two subjects =  $75 - 10 = 65$ . Then

$$40 + 50 - x = 65$$

$$x = 90 - 65 = 25 \text{ students}$$

Percentage of students who passed in both the subjects =  $\frac{25}{75} \times 100 = 33.33\%$ .

The correct answer is B.

198. What was the day on 1 January 2001?

(A) Thursday  
(B) Wednesday  
(C) Monday

(D) Tuesday

(E) Friday

The day on 1st January 2001 can be determined as:  
2000 years will contribute 0 odd days.

So, the last day of the year 2000 will be a Sunday.

Therefore, 1 January 2001 will be a Monday.

The correct answer is C.

199. A group of friends contributed to the cost of a party where each person had to contribute the same integer amount. Since three people did not participate, the remaining people had to pay Rs. 10 more. If the total amount contributed is the minimum value possible, what would be the per person contribution had 10 people contributed to the party?

(A) Rs. 2  
(B) Rs. 5  
(C) Rs. 6  
(D) Rs. 8  
(E) Rs. 10

Let the number of persons be  $x$  and contribution per person be Rs.  $y$ .

Therefore, the total contribution is = Rs.  $xy$

$$\text{Also, the total contribution} \\ = (x - 3)(y + 10) = xy + 10x - 3y - 30$$

Since the contribution is the same, therefore:

$$xy = xy + 10x - 3y - 30$$

$$\Rightarrow 10x - 3y = 30$$

$$\Rightarrow 3y = 10x - 30$$

If  $x = 3$ ,  $y = 0$ ; this is not possible as the total contribution will be 0.

(Note that when  $x = 3$  or 4,  $y$  will not be an integer value).

If  $x = 6$ ,  $y = 10$ ; this condition is possible, so the minimum total contribution possible is Rs. 60.

If 10 people had joined for the party, contribution per person =  $\frac{60}{10} = \text{Rs. } 6$

The correct answer is C.



200. Find the slope of line AB that is perpendicular to the line EF whose equation is  $4y + 12x = 48$ .

- (A)  $\frac{2}{3}$   
 (B)  $\frac{1}{3}$   
 (C) 3  
 (D) -3  
 (E)  $-\frac{1}{3}$

First rewrite the equation for EF in the slope intercept form,

$$4y + 12x = 48$$

Dividing the entire equation by 4, we get

$$y + 3x = 12$$

$$y = -3x + 12$$

Thus, the slope of EF = -3

Since slopes of perpendicular lines are negative reciprocals of each other,

$$\text{Slope of AB} = \frac{1}{3}$$

The correct answer is B.

201. What is the total surface area of a cone where slant height  $l$  is 13 cm and the radius of the base is 5 cm?

- (A) 162.85  
 (B) 196  
 (C) 282.85  
 (D) 296  
 (E) 340.85

The relation between  $l$ ,  $r$  and  $h$  is

$$l^2 = r^2 + h^2$$

Substituting the given values, we have

$$169 = 25 + h^2$$

$$h^2 = 144 \Rightarrow h = 12 \text{ cm}$$

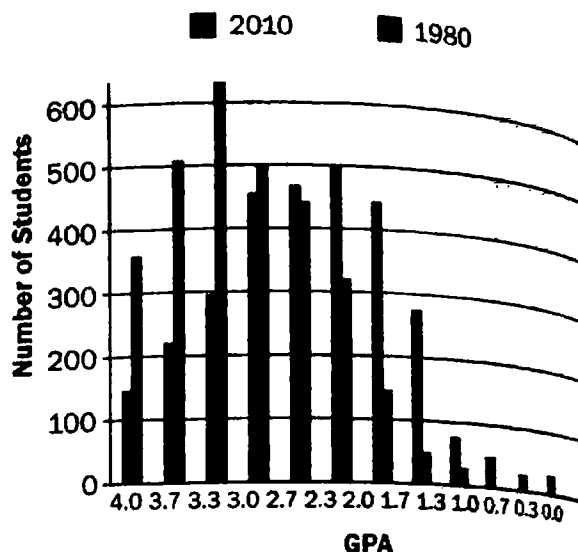
Now, total surface area =  $\pi r(r + l)$

$$= \frac{22}{7} \times 5(18)$$

$$= \frac{1980}{7} \text{ cm}^2 = 282.85 \text{ cm}^2$$

The correct answer is C.

Directions for Questions 202–205: Refer to the following graph and answer the questions.



Comparison of GPAs of 3000 students in 1980 and in 2010

202. What was the mode for the GPA among the 3,000 students in 2010?

- (A) 3.7  
 (B) 3.3  
 (C) 3.0  
 (D) 2.7  
 (E) 2.3

The mode of a list of numbers is the number that occurs most frequently in the list. In the bar graph for GPA, dark gray bars represent the students in 2010, and the mode of that data set is indicated by the tallest dark gray bar. This is at grade point average of 3.3. There were 625 students with a grade point average of 3.3 in the year 2010, more students than had any other grade point average.

The correct answer is B.

203. What was the median GPA among the 3,000 students in 1980?

- (A) 3.7  
 (B) 3.3  
 (C) 3.0  
 (D) 2.7  
 (E) 2.3

The median is the 'middle value' of an ordered list of numbers, dividing the list into roughly two equal parts. For the 3,000 students in 1980, the median GPA is the average of the 1,500<sup>th</sup> and the 1,501<sup>st</sup>.

highest GPA. The students in 1980 are represented by the light gray bars.

150 students had a 4.0 GPA.

225 students had a 3.7 GPA. (Total with this GPA and higher =  $150 + 225 = 375$ )

300 students had a 3.3 GPA. (Total with this GPA and higher =  $375 + 300 = 675$ )

450 students had a 3.0 GPA. (Total with this GPA and higher =  $675 + 450 = 1,125$ )

475 students had a 2.7 GPA. (Total with this GPA and higher =  $1,125 + 475 = 1,600$ )

The 1,500<sup>th</sup> and 1,501<sup>st</sup> students fall between the 1,125<sup>th</sup> and 1,600<sup>th</sup> students. Thus, the 1,500<sup>th</sup> and 1,501<sup>st</sup> highest grade point averages are both 2.7.

The correct answer is D.

204. Approximately what percentage of the students in 2010 earned at least a 3.0 GPA?

- (A) 25%  
(B) 50%  
(C) 67%  
(D) 80%  
(E) 97.5%

In 2010,

350 students had a 4.0 GPA.

525 students had a 3.7 GPA.

625 students had a 3.3 GPA.

500 students had a 3.0 GPA.

Thus, there were  $350 + 525 + 625 + 500 = 2,000$  students who earned at least a 3.0 GPA in the year 2010, out of a total of 3,000 students. This is  $\frac{2}{3}$  of the students, or about 67% of the students.

The correct answer is C.

205. Approximately what percentage of the students in 1980 earned a GPA less than 3.0?

- (A) 33%  
(B) 37.5%  
(C) 50%  
(D) 62.5%  
(E) 75%

In 1980,

150 students had a 4.0 GPA.

225 students had a 3.7 GPA.

300 students had a 3.3 GPA.

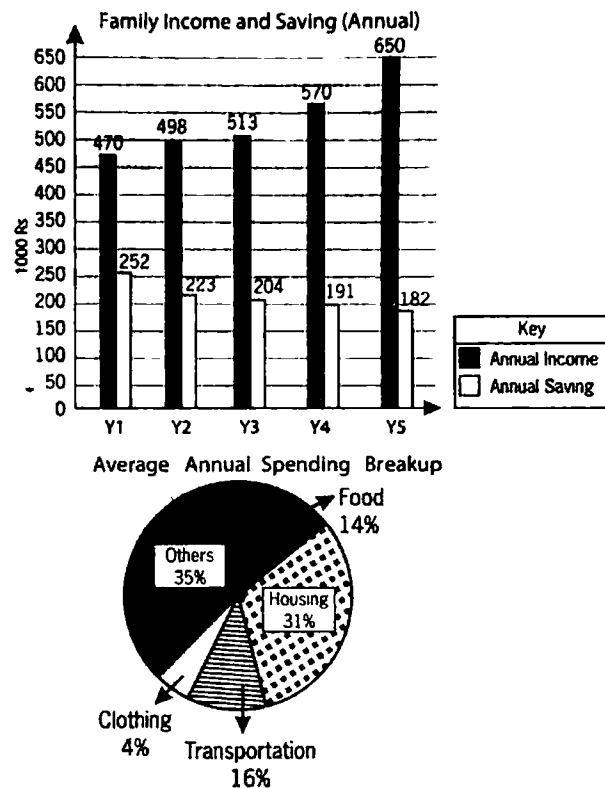
450 students had a 3.0 GPA.

In 1980,  $150 + 225 + 300 + 450 = 1,125$  students had a GPA of 3.0 or higher. Thus,  $3,000 - 1,125 = 1,875$  students earned a GPA less than 3.0. As a percent of the class, this was  $\left(\frac{1,875}{3,000}\right) \times 100 = 62.5\%$

The correct answer is D.

Directions for Questions 206–209: Go through the given graphs and solve the questions based on them.

(Real NMAT Question)



206. The annual family spending in the year preceding Y1 was Rs. 1,50,000. Which year recorded the lowest percentage increase in the annual family spending over the preceding year?

- (A) Y1  
(B) Y2  
(C) Y3  
(D) Y4  
(E) Y5

Annual spending in year preceding Y1 = 1,50,000

Annual spending in Y1 = 4,70,000 – 2,52,000  
= Rs. 2,18,000

Annual spending in Y2 = 4,98,000 – 2,23,000  
= Rs. 2,75,000

Annual spending in Y3 = 5,13,000 – 2,04,000  
= Rs. 3,09,000

Annual spending in Y4 = 5,70,000 - 1,91,000  
= Rs. 3,79,000

Annual spending in Y5 = 6,50,000 - 1,82,000  
= Rs. 4,68,000

Percentage increase in annual family spending in Y1  
=  $\frac{(2,18,000 - 1,50,000)}{1,50,000} \times 100 = 45.33\%$

Percentage increase in annual family spending in Y2  
=  $\frac{(2,75,000 - 2,18,000)}{2,18,000} \times 100 = 26.15\%$

Percentage increase in annual family spending in Y3  
=  $\frac{(3,09,000 - 2,75,000)}{2,75,000} \times 100 = 12.36\%$

Percentage increase in annual family spending in Y4  
=  $\frac{(3,79,000 - 3,09,000)}{3,09,000} \times 100 = 22.65\%$

Percentage increase in annual family spending in Y5  
=  $\frac{(4,68,000 - 3,79,000)}{3,79,000} \times 100 = 23.48\%$

As we can see, it is minimum for Y3.

**The correct answer is C.**

207. What was the total increase in the amount of money the family spent annually on buying food and clothing in Y2 over Y1?

- (A) Rs. 10,260  
(B) Rs. 20,520  
(C) Rs. 28,980  
(D) Rs. 39,240  
(E) Rs. 49,500

Y2 4,98,000 - 2,23,000 = 2,75,000

Food and clothing = 14% + 4% = 18%

$\frac{2,75,000}{100} \times 18 = 49,500$

Y1 4,70,000 - 2,52,000 = 2,18,000

Food and clothing = 14% + 4% = 18%

$\frac{2,18,000}{100} \times 18 = 39,240$

49,500 - 39,240 = 10,260

**The correct answer is A.**

208. In which year did the family spend a total of exactly Rs. 60,640 on transportation?

- (A) Y1  
(B) Y2  
(C) Y3  
(D) Y4  
(E) Y5

$5,70,000 - 1,91,000 = \frac{3,79,000}{100} \times 16 = 60,640$

**The correct answer is D.**

209. On which item did the family spend between Rs. 1 lakh and Rs. 1.2 lakh annually in Y4?

- (A) Food  
(B) Housing  
(C) Transportation  
(D) Clothing  
(E) Other

Annual spending in Y4 = 3,79,000

1 lakh to 1.2 lakh means 26.38% - 31.66% of 3,79,000

So, we need to find the head under which the expenditure should be in range 26.38% to 31.66%

As we can see from given graph that expenditure on housing is 31%.

**The correct answer is B.**

210. Find the sum to infinite terms of the series

$\frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \dots$

- (A)  $\frac{1}{2}$   
(B)  $\frac{1}{3}$   
(C)  $\frac{1}{4}$   
(D)  $\frac{1}{6}$   
(E)  $\frac{1}{8}$

As per the problem,

$$a = \frac{1}{4} \text{ and } r = \frac{1}{4}$$

$$\begin{aligned}
 \text{Sum to infinite terms} &= \frac{a}{1-r} \\
 &= \frac{\frac{1}{4}}{\left(1 - \frac{1}{4}\right)} \\
 &= \frac{1}{4} \times \frac{4}{3} \\
 &= \frac{1}{3}
 \end{aligned}$$

The correct answer is B.

211. Which term of the AP series 3, 8, 13, ... is the term 78?

(A) 14  
(B) 15  
(C) 16  
(D) 17  
(E) 18

In the given AP

$$a_n = a + (n-1)d = 78$$

We have  $a = 3$ ,  $d = 8 - 3 = 5$ . Therefore,

$$3 + (n-1) \times (5) = 78$$

$$(n-1) \times 5 = 78 - 3 = 75$$

$$n-1 = \frac{75}{5} = 15$$

$$n = 15 + 1 = 16$$

The correct answer is C.

212. Find the ninth term of an AP whose first term is 5 and common difference is 4.

(A) 35  
(B) 37  
(C) 41  
(D) 43  
(E) 47

Given that the first term is 5 and common difference is 4, the ninth term can be written as

$$T_9 = a + 8d$$

$$= 5 + (8 \times 4)$$

$$= 5 + 32 = 37$$

The correct answer is B.

213. In an exam where 175 students appeared, 140 passed in physics, 150 in biology while 10 failed in both the subjects. Find the percentage of people who passed in both the subjects.

(A) 68.71%  
(B) 71.42%  
(C) 74.56%  
(D) 78.54%  
(E) 81.76%

Let  $x$  be the number of students who passed in both the subjects.

As 10 students failed in both the subjects, the number of students who passed in at least one of the two subjects  $= 175 - 10 = 165$ . Then

$$140 + 150 - x = 165$$

$$x = 290 - 165 = 125 \text{ students}$$

Percentage of students who passed in both the subjects

$$\frac{125}{175} \times 100 = 71.42\%$$

The correct answer is B.

**Direction for Questions 214–215:** Each data sufficiency problem consists of a question and two statements, labelled (1) and (2), which contain certain data. Using these data and your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of the word counterclockwise), decide whether the data given are sufficient for answering the question and then indicate one of the following answer choices:

- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

214. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

**(Real NMAT Question)**

What is the value of  $Q$ ?

- (1) Ratio of  $P$  and  $Q$  is 3:5, where  $P$  is positive.  
(2) Ratio of  $P$  and  $Q$  is  $\frac{6}{20}$ , where  $Q$  is positive.

From statement (1), we have

$$\frac{P}{Q} = \frac{3}{5}$$

This information alone is not sufficient to calculate the value of  $Q$ .

From statement (2), we have

$$\frac{P}{Q} = \frac{6}{20} = \frac{3}{10}$$

This information is contradictory to the information given in (1). Also, (2) alone is not sufficient to calculate the value of  $Q$ .

Thus, the information from (1) and (2), when combined together is not sufficient to calculate the value of  $Q$ .

The correct answer is E.

215. What percentage of a group of people are men with MBA degrees?

(1) Of all the men in the group, 25% have MBA degrees.

(2) Of all the women in the group, 30% have MBA degrees.

Since we don't have the total number of people given to us, or the ratio of men to women, we cannot arrive at the answer even by combining both the statements.

The correct answer is E.

216. Priya deposited Rs. 20,000 on 1st January 2014 to open a savings account. She withdrew Rs. 1,000 on the 10th of every month. She closed her account on 6th June 2014. If the bank pays interest at 4% p.a., then approximately how much interest did she receive on closing the account?  
(Real NMAT Question)

- (A) Rs. 192  
(B) Rs. 283  
(C) Rs. 296  
(D) Rs. 384  
(E) Rs. 420

The interest  $I$  on principal  $P$  for  $D$  days at  $R\%$  p.a. is given as

$$I = P \times D \times \frac{2R}{73,000}$$

From 1<sup>st</sup> January to 9<sup>th</sup> January,

$P = \text{Rs. } 20,000$ ,  $D = 9$  and  $R = 4\%$  p.a.

$$\begin{aligned} \text{Therefore, interest, } I_1 &= \frac{20,000 \times 9 \times 8}{73,000} \\ &= \frac{14,40,000}{73,000} = \text{Rs. } 19.73 \end{aligned}$$

From 10<sup>th</sup> January to 9<sup>th</sup> February,  
 $P = \text{Rs. } 19,000$ ,  $D = 31$  and  $R = 4\%$  p.a.

$$\begin{aligned} \text{Therefore, interest, } I_2 &= \frac{19,000 \times 31 \times 8}{73,000} \\ &= \frac{47,12,000}{73,000} = \text{Rs. } 64.55 \end{aligned}$$

From 10<sup>th</sup> February to 9<sup>th</sup> March,

$P = \text{Rs. } 18,000$ ,  $D = 28$  and  $R = 4\%$  p.a.

$$\begin{aligned} \text{Therefore, interest, } I_3 &= \frac{18,000 \times 28 \times 8}{73,000} \\ &= \frac{40,32,000}{73,000} = \text{Rs. } 55.23 \end{aligned}$$

From 10<sup>th</sup> March to 9<sup>th</sup> April,

$P = \text{Rs. } 17,000$ ,  $D = 31$  and  $R = 4\%$  p.a.

$$\begin{aligned} \text{Therefore, interest, } I_4 &= \frac{17,000 \times 31 \times 8}{73,000} \\ &= \frac{42,16,000}{73,000} = \text{Rs. } 57.75 \end{aligned}$$

From 10<sup>th</sup> April to 9<sup>th</sup> May,

$P = \text{Rs. } 16,000$ ,  $D = 30$  and  $R = 4\%$  p.a.

$$\begin{aligned} \text{Therefore, interest, } I_5 &= \frac{16,000 \times 30 \times 8}{73,000} \\ &= \frac{38,40,000}{73,000} = \text{Rs. } 52.60 \end{aligned}$$

From 10<sup>th</sup> May to 6<sup>th</sup> June,

$P = \text{Rs. } 15,000$ ,  $D = 28$  and  $R = 4\%$  p.a.

$$\begin{aligned} \text{Therefore, interest, } I_6 &= \frac{15,000 \times 28 \times 8}{73,000} \\ &= \frac{33,60,000}{73,000} = \text{Rs. } 46.03 \end{aligned}$$

$$\begin{aligned} \text{Total Interest} &= I_1 + I_2 + I_3 + I_4 + I_5 + I_6 \\ &= 19.73 + 64.55 + 55.23 + 57.75 + 52.60 + 46.03 \\ &= \text{Rs. } 295.89 = \text{Rs. } 296 \text{ approximately} \end{aligned}$$

The correct answer is C.

217. In a classroom, one student is to be selected at random to solve a question. What is the probability that a girl will be selected?

(1) Two-fifths of the students in the classroom are boys.

(2) 15 of the students in the classroom are boys.

(A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.

(B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.

(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.

(D) EACH statement ALONE is sufficient.

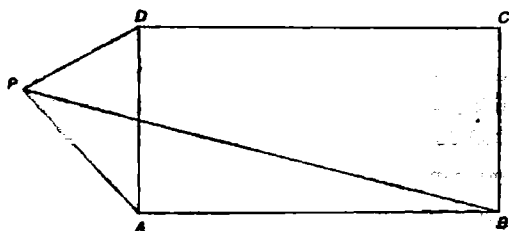
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

If  $\frac{2}{5}$  of the students are boys, this means that  $\frac{3}{5}$  of the students are girls. So the required probability is  $\frac{3}{5}$ . Statement 1 is sufficient.

Statement 2 does not help since we don't know the total number of students in the class.

The correct answer is A.

218. In the figure below, ABCD is a rectangle. If AP = 4 cm, DP = 3 cm and BP = 9 cm, what is the length of CP? (Real NMAT Question)



- (A) 7 cm  
(B) 8 cm  
(C)  $\sqrt{74}$  cm  
(D)  $\sqrt{84}$  cm  
(E)  $\sqrt{91}$  cm

We know that the sum of any two sides of a triangle is always greater than the third side.

Applying this property in triangles ABP and CDP, we get:

$$PB < AP + AB$$

$$PC < DP + CD$$

Now,

$$PB - PC < AP + AB - DP - CD$$

As ABCD is a rectangle, we have,

$$AB = CD$$

$$\text{Therefore, } PB - PC < AP - DP$$

Putting the values, we get

$$9 - PC < 4 - 3$$

$$\text{Or, } PC > 8$$

Also as  $DP < AP$  so,  $CP < BP$  that is  $PC < 9$

Hence, combining both the inequalities, we have  $8 < PC < 9$

Looking at the options, C satisfies the above condition.

The correct answer is C.

219. In the  $xy$ -coordinate plane, line  $L$  is perpendicular to the  $y$ -axis and passes through the point  $(8, -4)$ . Which of the following is an equation of the line  $L$ ?

(A)  $x = -4$

(B)  $x = 8$

(C)  $y = -8$

(D)  $y = -4$

(E)  $y - 4 = x + 8$

$L$  is perpendicular to the  $y$ -axis, that is it is parallel to the  $x$ -axis, which means its slope is 0. Then its  $y$ -intercept has to be  $-4$  since  $L$  is perpendicular to the  $y$ -axis.

Equation of  $L$

$$y = mx + c$$

$$y = 0(x) + (-4)$$

$$y = -4$$

The correct answer is D.

220. A number when used to divide 1,691, 2,171 and 2,651 leaves the same remainder in each case. Find the largest such number. (Real NMAT Question)

(A) 240

(B) 360

(C) 480

(D) 720

(E) 960

The largest number used to divide 1,691, 2,171 and 2,651 which leaves the same remainder in each case will be the HCF of the differences of any two of the three numbers, that is  $(2,171 - 1,691 = 480)$ ,  $(2,651 - 2,171 = 480)$  and  $(2,651 - 1,691 = 960)$ .

Therefore, the required number is HCF of 480, 480 and 960, which is 480.

The correct answer is C.

**Directions for Questions 221–223:** The table on the next page shows the incomplete data for the sale of confectionery in the Selaqui market in the year 2012–2013. The data are shown for two brands called A and B and the total market. All the other brands in the market have

Details	2012			2013		
	A	B	Total market	A	B	Total market
Sales in Rs.		40,000		60,000		
Market share		25%			33.33%	
Growth rate	66.66%		25%	25%		20%

been classified as 'Others'. All the questions are related to this data only. The growth rate indicated in the table is the growth rate in sales on value basis. Assume that the number of companies in the Selaqui market is the same in all the years mentioned.

**General Explanation for Questions 221–223:** The sales of company A has grown by 25% from 2012 to 2013.

Let the total sales of company A in 2012 be Rs.  $X$ .  
Therefore,

$$X \times \left( \frac{125}{100} \right) = 60,000$$

$$X = \text{Rs. } 48,000$$

Also, the sale of company A has grown by 66.66% from 2011. Let the sales of company A in 2011 be Rs.  $Y$ . Therefore,

$$Y \times \left( \frac{166.66}{100} \right) = 48,000$$

$$\Rightarrow Y = 28,800$$

Also, the total market in 2012 is Rs. 1,60,000 and this has grown by 25% from 2011.

Therefore, the total market in 2011 = Rs. 1,28,000

Out of this sale of A = Rs. 28,800

Sale of others = Rs. 48,000

Therefore, sale of B = 1,28,000 – 48,000 – 28,800 = 51,200

- 221.** If all the 'Other' brands had a total sale of Rs. 48,000 in the year 2011, what is the market share of company B in the year 2011?

- (A) 20%  
(B) 24%  
(C) 32%  
(D) 40%  
(E) Cannot be determined

$$\text{Market share of brand B in 2011} = \frac{51,200}{1,28,000} \times 100 = 40\%$$

The correct answer is D.

- 222.** What was the market share of brand A in the year 2012?

- (A) 20%  
(B) 22.5%  
(C) 28%  
(D) 30%  
(E) Cannot be determined

Market share of company A in 2012

$$= \frac{48,000}{1,60,000} \times 100 = 30\%$$

The correct answer is D.

- 223.** If there were no new entrants and all the existing brands grew by 5% in 2014 as compared to the previous year, find the total value of the confectionery market in Selaqui in the year 2014.

- (A) 1,96,600  
(B) 1,97,900  
(C) 2,00,000  
(D) 2,01,600  
(E) None of these

The total market value in the year 2013 = 1,60,000  
 $\times 1.2 = 1,92,000$

If all the brands grew by 5%, the market would have also grown by 5% in 2014.

Total value of the market in the year 2014 =  
 $1,92,000 \times 1.05 = \text{Rs. } 2,01,600$

The correct answer is D.

- 224.** Find the total surface area of an ice cream which is in the form of a hemisphere mounted on a cone of radius 19 mm. The total height of the ice cream is 199 mm. (Real NMAT Question)

- (A)  $3,610 \pi$  sq mm  
(B)  $3,781 \pi$  sq mm  
(C)  $4,161 \pi$  sq mm  
(D)  $11,872 \pi$  sq mm  
(E)  $15,124 \pi$  sq mm

Total surface area of ice cream

$$\begin{aligned}
 &= 2\pi r^2 + \pi r \sqrt{r^2 + h^2} \\
 &= 2\pi(19)^2 + \pi \times 19 \times \sqrt{19^2 + 180^2} \\
 &= 722\pi + 3,439\pi = 4,161\pi \text{ sq mm}
 \end{aligned}$$

The correct answer is C.

225. Jasmine has a collection of 1 rupee, 50 paise and 25 paise coins kept in a jar. If the number of 1 rupee, 50 paise and 25 paise coins are in the ratio of 5 : 6 : 8 and makes a sum of Rs. 210, how many one rupee coins does she have? (Real NMAT Question)

- (A) 42  
(B) 63  
(C) 100  
(D) 105  
(E) 126

Ratio of the number of one rupee, 50 paise and 25 paise coins, respectively, in the jar = 5 : 6 : 8

Let the number of one rupee, 50 paise and 25 paise coins in the jar be  $5x$ ,  $6x$  and  $8x$ , respectively.

$$\text{Now, } 1 \times 5x + 0.5 \times 6x + 0.25 \times 8x = 210$$

$$5x + 3x + 2x = 210$$

$$10x = 210$$

$$x = 21$$

Therefore, Number of one rupee coins that Jasmine has =  $5x = 5 \times 21 = 105$

The correct answer is D.

**Directions for Questions 226–228:** In a newly launched video game 'Shoot At Sight', each player is supposed to shoot at targets on the screen. For each hit, the score of the player is doubled while for each miss, the score is halved. Each player is given 10 shots at the targets. Each player starts with 100 points in his account initially. The game is over as soon as a player uses all the 10 shots. Two friends, Jai and Viru, played the game and finished with total of 6,400 and 1,600 points respectively. (Real NMAT Question)

226. If Jai did not hit the target more than three times consecutively at any time, then which of the following cannot be the shot which he missed?

(Real NMAT Question)

- (A) 3<sup>rd</sup> shot  
(B) 4<sup>th</sup> shot  
(C) 6<sup>th</sup> shot  
(D) 7<sup>th</sup> shot  
(E) 8<sup>th</sup> shot

Suppose Jai had  $x$  hits and  $10 - x$  misses.

Therefore, his total score

$$= 100 \times 2^x \times \left(\frac{1}{2}\right)^{10-x} = 6,400$$

We get  $x = 8$ . So, Jai had 8 hits and 2 misses.

Similarly, Viru had 7 hits and 3 misses.

It is given that Jai did not hit the target more than three times consecutively at any time. In order to find the shot that CANNOT be the shot which he missed, try out given options one by one to find out the shot that CAN be the shot which he missed. For example, let us suppose that 3<sup>rd</sup> shot can be the shot that he missed. Now, let us arrange 8 hits and 2 misses among 10 shots in such a way that there are no more than 3 hits in a row. In this case, we can have the arrangement as:

1st shot	2nd shot	3rd shot	4th shot	5th shot	6th shot	7th shot	8th shot	9th shot	10th shot
H	H	M	H	H	H	M	H	H	H

So, 3<sup>rd</sup> can be one of the shots that he missed.

Similarly, on checking all other options, it is found that 6<sup>th</sup> shot cannot be the shot that he missed.

The correct answer is C.

227. Which of the following cannot be the total points of Viru, after taking his 6<sup>th</sup> shot at the target? (Real NMAT Question)

- (A) 100  
(B) 200  
(C) 400  
(D) 1,600  
(E) 6,400

In order to find out which of the given options cannot be the total points of Viru after taking his 6<sup>th</sup> shot at the target, eliminate the wrong options one by one by finding out which ones can be the total points of Viru after taking his 6<sup>th</sup> shot at the target. While doing this, the following facts should always be kept in mind:

- Viru had 7 hits and 3 misses.
- His total score was 1,600.

Suppose the total points of Viru after taking his 6<sup>th</sup> shot at the target are 100. One of the possible scenarios is as follows:



	6th shot	7th shot	8th shot	9th shot	10th shot
Hit/Miss	Hit	Hit	Hit	Hit	hit
Score after the shot	100	200	400	800	1,600

So, 100 is not the correct answer.

Similarly, on checking the rest of the options for the possibility of any such scenario, it is found that 200 is the only option without any such scenario.

**The correct answer is B.**

228. If all the missed shots of both Jai and Viru came within the first 5 shots they took individually, then which of the following cannot be the sum of their total points after they took their 4th shot each? (*Real NMAT Question*)

(A) 125  
(B) 200  
(C) 325  
(D) 425  
(E) 500

Jai had 8 hits (H) and 2 misses (M). Similarly, Viru had 7 hits and 3 misses.

For Jai, there are  ${}^5C_2$  ways in which 2 misses can take place within the first 5 shots.

1st shot	2nd shot	3rd shot	4th shot	5th shot	Total score after 4th shot
M	M	H	H		100
M	H	M	H		100
M	H	H	M		100
M	H	H	H	M	400
H	M	M	H		100
H	M	H	M		100
H	M	H	H	M	400
H	H	M	M		100
H	H	M	H	M	400
H	H	H	M	M	400

So, Jai's total score after 4th shot can be either 100 or 400. Similarly, Viru's total score after 4th shot can be either 100 or 25.

Therefore, possible sum of their total points after they took their 4th shot each are 200 (= 100 + 100), 125 (= 100 + 25), 500 (= 400 + 100) and 425 (= 400 + 25).

Out of five given options, the only option that is not mentioned in the above list is 325. Thus, 325 cannot be the sum of their total points after they took their 4th shot each.

**The correct answer is C.**

229. When 10 grams of sugar is added to 225 grams of a brand of sweetened cornflakes, the resulting mixture is 10% sugar. What was the percentage of sugar in the 225 grams of cornflakes? (*Real NMAT Question*)

(A) 5.6%  
(B) 5.7%  
(C) 6%  
(D) 6.4%  
(E) 10%

Let the amount of sugar in 225 grams of cornflakes be  $x$  gram.

$$\frac{10 + x}{235} \times 100 = 10$$

Therefore,  $x = 13.5$  grams

Percentage of sugar in the 225 grams of cornflakes  
 $= \frac{13.5}{225} \times 100 = 6\%$

**The correct answer is C.**

230. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

Ramu and Somu were born into a family who had worked in the textile business for generations. While their ancestors believed that a zero clash of professional interests could be ensured only by family members taking up different segments of the textile business, the two brothers felt that if they both worked on the same segment, complementing each other but engaging in healthy competition, it would bring about brighter business prospects. Both of them stocked and sold the same merchandise and often bought textile goods from the same source, though not necessarily on the same terms and conditions. (*Real NMAT Question*)

The two brothers decided to enter a strategic price war by offering discounts on a piece of dress material which was not selling well.

Whose customer, Ramu's or Somu's, got a better deal?

- (1) Somu offered 20% discount and on further demand from the customer, gave him a cash discount of Rs. 1,000.

- (2) Ramu's cash discount of Rs. 1,000 did not attract customers. So he announced an additional 20% discount.
- (A) Statement (1) ALONE is sufficient, but Statement (2) is not sufficient.
- (B) Statement (2) ALONE is sufficient, but Statement (1) is not sufficient.
- (C) BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

To answer the question, we need details of discounts offered by both Somu and Ramu. Thus, either of the statements is not sufficient by itself to give the answer.

Combining the two statements,

Let the original selling price of the dressing material be Rs.  $x$ .

Selling price offered by Somu (after discount) =

$$\text{Rs. } \frac{80}{100} \times x - 1,000$$

Selling price offered by Ramu (after discount)

$$= (x - 1,000) - \frac{20}{100} \times (x - 1,000)$$

$$= \left(1 - \frac{20}{100}\right) \times (x - 1,000)$$

$$= \frac{80}{100} \times (x - 1,000) = \text{Rs. } \frac{80}{100} \times x - 800$$

Thus, Somu's customer got a better deal.

The correct answer is C.

**Directions for Questions 231–234:** The table below shows the information about number of laptops (figures in 1000s) of different models produced and rejected by a company over six years.

231. In case of Type Q laptop, in which year was the ratio of rejection to production the highest among the given years?

- (A) 2010  
(B) 2011  
(C) 2012  
(D) 2014  
(E) 2015

$$\text{Ratio in 2010} = \frac{3}{50} = 0.06$$

$$\text{Ratio in 2011} = \frac{2}{45} = 0.044$$

$$\text{Ratio in 2012} = \frac{2.5}{40} = 0.0625$$

$$\text{Ratio in 2014} = \frac{2.5}{48} = 0.052$$

$$\text{Ratio in 2015} = \frac{2.1}{41} = 0.051$$

Thus, the ratio was highest in 2012.

The correct answer is C.

232. In which year was the ratio of rejection to production the lowest among the given years for type T laptop?

- (A) 2010  
(B) 2012  
(C) 2013  
(D) 2014  
(E) 2015

$$\text{Ratio in 2010} = \frac{4}{60} = 0.066$$

$$\text{Ratio in 2012} = \frac{3.5}{62} = 0.056$$

$$\text{Ratio in 2013} = \frac{1.5}{40} = 0.037$$

$$\text{Ratio in 2014} = \frac{2}{45} = 0.044$$

Laptop model	P		Q		R		S		T	
Year	Produced	Rejected	Produced	Rejected	Produced	Rejected	Produced	Rejected	Produced	Rejected
2010	20	2	50	3	15	0.5	80	5	60	4
2011	35	3	45	2	20	0.55	75	4	58	4
2012	15	0.5	40	2.5	17	0.7	58	2	62	3.5
2013	25	0.25	42	2.3	25	1.5	65	3	40	1.5
2014	30	1.5	48	2.5	30	2	68	3	45	2
2015	27	1.5	41	2.1	26	1.75	72	3.5	50	2.3

$$\text{Ratio in 2015} = \frac{2.3}{50} = 0.046$$

Thus, the ratio was lowest in 2013

The correct answer is C.

233. What was the difference in Type R laptops rejected between 2011 and 2012?

- (A) 150  
(B) 200  
(C) 250  
(D) 2000  
(E) 2400

$$\text{The required difference} = 700 - 550 = 150$$

The correct answer is A.

234. The acceptable (not rejected) Type T laptops in 2012 were what percentage of those in 2011?

- (A) 8  
(B) 14  
(C) 106  
(D) 108  
(E) 110

$$\text{The required percentage} = \left( \frac{62 - 3.5}{58 - 4} \right) \times 100 =$$

approximately 108%

The correct answer is D.

235. Sheila borrowed Rs. 6,240 from Shyam on September 1 and promised to repay it by the end of the month. Shyam put forth a condition that Sheila should repay an amount each day and that the difference between the amounts paid in any two consecutive days should be Rs. 10, i.e. the amount to be paid on a particular day (except the first day) should be Rs. 10 more than the amount paid on the previous day. How much did she pay Shyam on September 1? (Real NMAT Question)

- (A) Rs. 10  
(B) Rs. 38  
(C) Rs. 39  
(D) Rs. 68  
(E) None of the above

Let us assume that Sheila paid Rs.  $x$  to Shyam on September 1. As she has to repay the entire money, that is Rs. 6,240 in 30 days and the amounts paid on any day should be Rs. 10 more than the amount paid on the previous day,

$$x + x + 10 + x + 20 + \dots + x + 290 = 6,240$$

$$\frac{30}{2}(2 + 29 \times 10) = 6,240$$

$$30(2 + 290) = 12,480$$

$$60 + 8,700 = 12,480$$

$$60 \quad 3,780$$

$$63$$

So, Sheila paid Rs. 63 to Shyam on September 1.

The correct answer is E.

236. A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem. (Real NMAT Question)

What is the value of  $X$ ?

- (1) The absolute value of  $Y^2 - 4$  is multiplied by 3 which is equal to  $X - 2$ .  
(2) The absolute value of  $3 - X$  is equal to 11.  
(A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
(C) BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

From statement (1), we have

$$3 \times |Y^2 - 4| = X - 2$$

$$\Rightarrow X - 2 > 0 \Rightarrow X > 2$$

This information alone is not sufficient to calculate the value of  $X$ .

From statement (2), we have

$$|3 - X| = 11$$

$$\text{Therefore, } X = -8 \text{ or } 14$$

This information alone is not sufficient to calculate the value of  $X$ .

However, if we combine the information from both the statements, we get  $x = 14$

The correct answer is C.

237. The following table gives the percentage breakdown of the total marks obtained by 5 students A, B, C, D and E in 6 subjects, P, Q, R, S, T and U, of their final exams. The maximum marks in each subject

are 100 and every student got an integral score.  
(Real NMAT Question)

	P	Q	R	S	T	U
A	10	14	22	14	18	22
B	12	17	20	19	15	17
C	15	10	20	15	20	20
D	15	17	19	25	14	10
E	16	18	16	18	18	14

What can be the maximum possible total score achieved by any of these 5 students?

- (A) 450
- (B) 500
- (C) 550
- (D) 580
- (E) 600

In this question, two conditions have to be kept in mind:

- The maximum marks in each subject are 100.
- Every student got an integral score.

Try out each of the given options (starting with the highest and going in descending order) keeping above two conditions in mind to see if any of the students can have that as their total score. For example, suppose 600 is the maximum possible total score achieved by any of these 5 students. Then, the maximum possible subject-wise percentage for this

$$\text{total score} = \frac{(100 \times 100)}{600} = 16.7\% \text{ (approx.)}$$

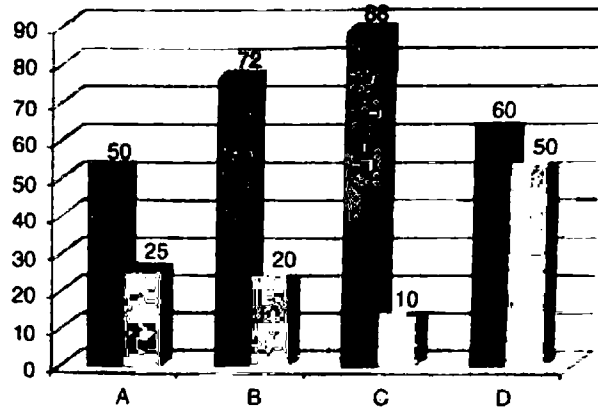
In other words, the maximum percentage a student can have in any subject for this score is 16.7%.

Now, if there is any student whose percentage breakup in different subjects is less than or equal to 16.7% and also if the marks obtained by him in different subjects are integers (assuming his total score as 600), then 600 is the correct answer. If not, do the same with rest of the options until these two conditions are met. For the first two options, that is 600 and 580, there is no such student for whom both of these conditions are met. For the third option, that is 550 as the total score, both of these conditions are met for student E. Therefore, the maximum possible total score achieved by any of these 5 students is 550.

The correct answer is C.

**Directions for Questions 238–243:** The following bar graph depicts the details of the number of students in four different sections of PKG in Ann Mary School. While the first bar represents the number

of students in that section in the current year, the second bar represents the percentage change in the number of students in that section from the previous year.



Further, it was noted that no two sections had the same number of students in any of the two years.

The number of sections that saw an increase in the number of students was the same as the number of sections where the total strength decreased.

**General Explanation for Questions 238–243:** Let  $y$  be the variable which represents the number of students in each of the four sections in the previous year. Section C has 88 students and there is a percent change of 10% from the previous year. The only possibility is

$$y \times \frac{110}{100} = 88 \Rightarrow y = 80 \text{ students}$$

For section A, the change has to be an increase of 25%.

Therefore,

$$y \times \frac{125}{100} = 50 \Rightarrow y = 40 \text{ students}$$

There will definitely be a decrease in the strength of the other two sections B and D.

For section B, we have

$$y \times \frac{80}{100} = 72 \Rightarrow y = 90 \text{ students}$$

For section D, we have

$$y \times \frac{50}{100} = 60 \Rightarrow y = 120 \text{ students}$$

**238.** What was the total strength of Section B in the previous year?

- (A) 60
- (B) 90
- (C) 80

- (D) 70  
(E) Cannot be determined

The correct answer is B.

239. In the previous year, what was the ratio of the number of students in Section C to those in Section D?

- (A) 1:3  
(B) 3:1  
(C) 2:3  
(D) 3:5  
(E) None of these

Required ratio =  $80:120 = 2:3$

The correct answer is C.

240. Which among the following sections saw the least change in the number of students from the previous year?

- (A) A  
(B) B  
(C) C  
(D) D  
(E) A and C

The correct answer is C.

241. If 50% of the total decrease is attributed to students shifting to other schools while the entire increase is due to new admissions, what is the difference between the number of students shifting to other schools and new admissions?

- (A) 18  
(B) 21  
(C) 26  
(D) 39  
(E) 60

Decrease in section B =  $90 - 72 = 18$  students

Decrease in section D =  $120 - 60 = 60$  students

Total decrease = 78 students

50 percent of this is due to students shifting to other schools = 39 students

New admissions =  $8 + 10 = 18$  new admissions

Difference =  $39 - 18 = 21$

The correct answer is B.

242. Which two sections saw a decrease in the number of students in the current year as compared to the previous year?

- (A) B and C  
(B) A and D  
(C) B and D  
(D) A and C  
(E) A and B

The correct answer is C.

243. Find the number of students in the previous year in Section D.

- (A) 40  
(B) 120  
(C) 60  
(D) 80  
(E) Cannot be determined

The correct answer is B.

**Directions for Questions 244–251:** Each data sufficiency problem consists of a question and two statements, labelled (1) and (2), which contain certain data. Using these data and your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of the word *counterclockwise*), decide whether the data given are sufficient for answering the question and then indicate one of the following answer choices:

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

**Note:** In data sufficiency problems that ask for the value of a quantity, the data given in the statements are sufficient only when it is possible to determine exactly one numerical value for quantity.

244. Find the value of the number if it is less than 100.

- (1) The number is a perfect square.  
(2) It is a multiple of 16.

Using Statement 1 alone, the question cannot be answered as there can be a number of possibilities such as 1, 4, 9, 16, 25, 36 and so on.

Using Statement 2 alone, there will again be a number of possibilities, such as 16, 32, 48, 64, etc.

However if we combine both the statements, there is only one possibility = 64.

Thus, C is the answer.

**The correct answer is C.**

**245.** Is  $pq > 0$ ? (Real NMAT Question)

(1)  $\left(\frac{p}{q}\right) > 0$

(2)  $p > 0$

We want to know whether  $pq > 0$

This is possible only in 2 cases: P is +ve and q is +ve OR p is -ve and q is -ve

So, we have to see whether, from given statements, we can find the sign for both p and q.

From Statement (1), p and q are of same sign (both positive or both negative). Thus, (1) alone is sufficient.

Statement (2) does not say anything about q being a positive or negative entity. So (2) alone is insufficient.

**The correct answer is A.**

**246.** Find the speed of the stream.

(1) A log of wood travels 4 km in 3 h.

(2) Speed of a boat while moving downstream is 7 km/h.

A log of wood does not have any power of its own so it moves at the same rate as the speed of the stream. Thus, Statement 1 is sufficient to answer the question.

The speed of a boat does not tell us anything about the speed of the stream. So Statement 2 is not sufficient.

**The correct answer is A.**

**247.** Find the average speed of tiger 'X'. (Real NMAT Question)

(1) Initially tiger 'X' covers some part of the distance at 57 m/s.

(2) Tiger 'X' covers the remaining part of the distance at 43 m/s.

We need to know the Total Distance covered in order to calculate the Average Speed.

Since neither of the statements alone or together tells us anything about the total distance travelled, the correct answer should be Option E.

**The correct answer is E.**

**248.** If a is an integer, is  $a + 1$  even?

(1)  $a + 2$  is an even integer.

(2)  $a - 1$  is an odd integer.

Statement 1: Since  $a + 2$  is even, a is an even integer, and therefore  $a + 1$  would be an odd integer; SUFFICIENT

Statement 2: Since  $a - 1$  is an odd integer, a is an even integer. Therefore  $a + 1$  would be an odd integer; SUFFICIENT.

**The correct answer is D.**

**249.** Who is the tallest among A, B, C, D and E?

(1) B and C are not the tallest.

(2) A is taller than D who in turn is taller than E.

While neither of the statements is sufficient by itself, using both the statements we can definitely say that A is the tallest.

**The correct answer is C.**

**250.** If Udit saved Rs. 1200 of his earnings last month, how much did Udit earn last month?

(1) Udit spent  $\frac{1}{2}$  of his earnings last month on household expenses and saved  $\frac{1}{4}$  of the remainder.

(2) Of his earnings last month, Udit paid twice as much in rent as he saved.

From statement 1, Let Udit's earning last month be x

$$\text{Then } \frac{1}{4} \times \frac{1}{2}x = 1200$$

By solving the above equation, we will get Udit's earnings for the last month; SUFFICIENT. (Remember, you do not need to try to solve this equation, it will only waste your time).

Statement 2 just tells us the relation between Udit's savings and his rent, which does not tell us anything about his overall earnings. So, the statement 2 is INSUFFICIENT.

**The correct answer is A.**

**251.** Water is pumped into a partially filled swimming pool at a constant rate through an inlet pipe. At the same time, water is pumped out of the pool at a constant rate through an outlet pipe. At what rate, in litres per minute, is the amount of water in the pool increasing?

(1) The amount of water initially in the pool is 500 litres.

(2) Water is pumped into the pool at a rate of 50 litres per minute and out of the pool at a rate of 20 litres every 4 minutes.

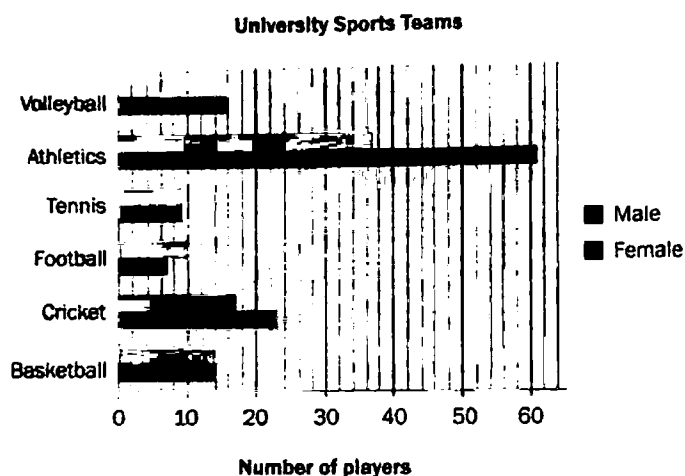
From Statement 1, the original amount of water in the pool is irrelevant, since we only have to figure out the rate of increase. So, Statement 1 is Not Sufficient

From Statement 2, water is being pumped in at 50 litres per minute and pumped out at  $\frac{20}{4} = 5$  litres

per minute. Thus, the net rate of addition =  $50 - 5 = 45$  litres per minute. So Statement 2 ALONE is sufficient.

**The correct answer is B.**

**Directions for Questions 252-255:** Go through the given graph and solve the questions based on it.



- 252.** What is the ratio of male players to female players on the Athletics team?

(A) 37 : 61  
(B) 9 : 17  
(C) 16 : 23  
(D) 14 : 19  
(E) 61 : 37

Note that there are 5 vertical grid lines for every 10 players, so each vertical grid line accounts for 2 players. On the Athletics team, there are between 36 and 38 men (so it must be 37) represented by the light gray bar. On the Athletics team, there are between 60 and 62 women (so it must be 61) represented by the dark gray bar. In fractional form, the required ratio =  $\frac{37}{61}$

**The correct answer is A.**

- 253.** All players, except those in Athletics and Cricket teams, are a part of only one team. If there are a total of 76 male players in different university sports

teams, how many male players are in both Athletics team and Cricket team?

(A) 11  
(B) 17  
(C) 37  
(D) 54  
(E) 76

Note that there are 5 vertical grid lines for every 10 players, so each vertical grid line accounts for 2 players.

Male athletes are represented by the light gray bars for each sport. Sum the male athletes on each of the separate teams.

Males on Volleyball team: 10

Males on Athletics team: 37

Males on Tennis team: 9

Males on Football team: 10

Males on Cricket team: 17

Males on Basketball team: 14

There are  $0 + 37 + 9 + 10 + 17 + 14 = 87$  male players in all of the teams combined, but there are only a total of 76 male players. Thus, there must be  $87 - 76 = 11$  male players who are counted twice by being on both the Athletics and Cricket teams.

**The correct answer is A.**

- 254.** In which of the following university sports team(s) do male players outnumber female players?

(A) Athletics, Tennis and Football  
(B) Cricket  
(C) Football and Cricket  
(D) Football  
(E) Tennis and Athletics

A sport in which male players outnumber female players will have a shorter dark gray bar than a light gray bar. This is only the case for Football, where there are 10 male players and 7 female players.

**The correct answer is D.**

- 255.** What is the ratio of female tennis players to male basketball players on the university sports teams?

(A) 5 : 14  
(B) 9 : 14  
(C) 7 : 18  
(D) 14 : 9  
(E) 18 : 7

There are 9 female tennis players and 14 male basketball players.

Thus, the required ratio = 9 : 14

The correct answer is B.

**Directions for Questions 256–259:** The table below shows the number of male graduates, urban graduates and total graduates in some states as well as in India as a whole. Go through the given table and answer the questions based on it.  
(Real NMAT Question)

256. What can be the approximate number of female graduates living in rural areas of Andhra Pradesh?

- (A) 39,91,398
- (B) 59,76,435
- (C) 76,52,431
- (D) 99,95,643
- (E) Data inadequate

Using the information given in the table, we can calculate the number of graduates in rural areas. But, in order to obtain the number of female graduates living in rural areas, we need to have the number of male graduates living in rural areas, which has not been provided in the table. Thus, the given data is inadequate to calculate the number of female graduates living in the rural areas.

The correct answer is E.

257. What is the total population of Bihar and West Bengal?

- (A) 3,15,01,163
- (B) 4,95,76,435
- (C) 7,35,97,612
- (D) 16,33,40,653
- (E) 17,96,54,762

In Bihar,

Total graduates as % of state population = 15.7 %

Total number of graduates = 1,30,48,608

Now,

Total graduates as % of population of Bihar

$$= \frac{\text{Total number of graduates in Bihar}}{\text{Total population of Bihar}} \times 100$$

Therefore,

Total population of Bihar

$$= \frac{\text{Total number of graduates in Bihar}}{\text{Total graduates as % of population of Bihar}} \times 100$$

$$= \frac{1,30,48,608}{15.7} \times 100 = 8,31,12,152.87 \text{ (approx.)}$$

In West Bengal,

Total graduates as % of state population = 23 %

Total number of graduates = 1,84,52,555

Like in case of Bihar,

Total population of West Bengal

$$= \frac{\text{Total number of graduates in West Bengal}}{\text{Total graduates as % of population of West Bengal}} \times 100$$

$$= \frac{1,84,52,555}{23} \times 100$$

$$= 8,02,28,500$$

Therefore,

Total population of Bihar and West Bengal =

$$8,31,12,152.87 + 8,02,28,500 = 16,33,40,652.87$$

$$= 16,33,40,653 \text{ (approx.)}$$

The correct answer is D.

258. What percentage of graduates in India is female?

- (A) 46.34%
- (B) 48.34%
- (C) 50.43%
- (D) 51.66%
- (E) 52.34%

In India,

Total number of graduates = 16,66,35,700

State	Male Graduates	Urban Graduates	Total Number of Graduates	Total Graduates As % of State Population
Andhra Pradesh	62,28,011	21,20,087	1,23,39,496	16.2
Bihar	67,84,676	8,70,053	1,30,48,608	15.7
Tamil Nadu	59,32,925	35,48,614	1,18,57,504	19.0
Uttar Pradesh	1,85,02,838	43,31,781	3,51,48,377	21.1
West Bengal	94,69,659	29,27,630	1,84,52,555	23.0
India	8,60,88,760	3,36,24,822	16,66,35,700	16.2



Total number of male graduates = 8,60,88,760  
 Therefore, total number of female graduates  
 = 16,66,35,700 - 8,60,88,760 = 8,05,46,940  
 Percentage of female graduate in India

$$= \frac{\text{Total number of female graduates}}{\text{Total number of graduates}} \times 100$$

$$= \frac{8,05,46,940}{16,66,35,700} \times 100 = 48.34\% \text{ (approx.)}$$

The correct answer is B.

259. What percentage of graduates in Tamil Nadu and Uttar Pradesh live in urban areas?  
 (Real NMAT Question)

- (A) 14.74%  
 (B) 15.76%  
 (C) 16.76%  
 (D) 16.96%  
 (E) 17.16%

Total number of graduates in Tamil Nadu and Uttar Pradesh = 1,18,57,504 + 3,51,48,377  
 = 4,70,05,881

Total number of graduates in urban areas of Tamil Nadu and Uttar Pradesh = 35,48,614 + 43,31,781  
 = 78,80,395

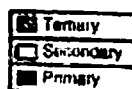
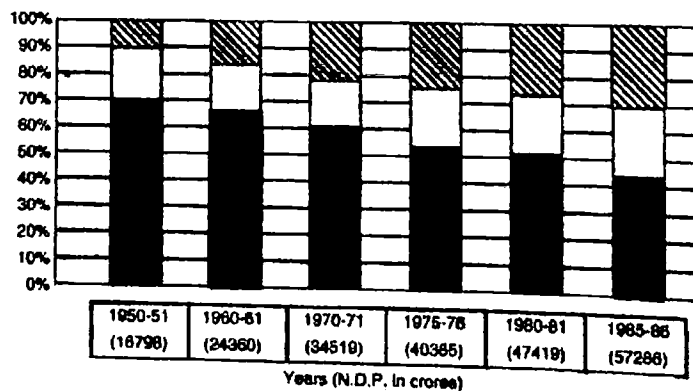
Percentage of graduates in urban areas of Tamil Nadu and Uttar Pradesh

$$= \frac{78,80,395}{4,70,05,881} \times 100 = 16.76\%$$

The correct answer is C.

Directions for Questions 260–263: Answer the questions on the basis of the information given below.  
 (Real NMAT Question)

Percentage Distribution of Domestic Produce at Factor Cost and at Constant Prices with base year 1970-71



260. What was the contribution (in billion rupees) of the primary sector to the N.D.P. in 1980–81?  
 (A) 143.7  
 (B) 173.6  
 (C) 189.7  
 (D) 237.1  
 (E) 390.5

Contribution (in billion rupees) of the primary sector to the N.D.P. in 1980–81

$$= \frac{50}{100} \times 47,419$$

= Rs. 237.1 billion

The correct answer is D.

261. In which year did the contribution of the tertiary sector register the maximum percentage increase with respect to previous data given?  
 (A) 1950–51  
 (B) 1960–61  
 (C) 1970–71  
 (D) 1980–81  
 (E) 1985–86

Approximate percentage increase in the contribution of the tertiary sector with respect to previous data given for different intervals of time is as follows:

For 1960–61,

$$\text{Percentage increase} = \frac{16 - 10}{10} \times 100$$

$$= \frac{6}{10} \times 100 = 60\%$$

For 1970–71,

$$\text{Percentage increase} = \frac{21 - 16}{16} \times 100$$

$$= \frac{5}{16} \times 100 = 31.25\%$$

For 1975–76,

$$\text{Percentage increase} = \frac{24 - 21}{21} \times 100$$

$$= \frac{3}{21} \times 100 = 14.28\%$$

For 1980–81,

$$\text{Percentage increase} = \frac{26 - 24}{24} \times 100$$

$$= \frac{2}{12} \times 100 = 16.67\%$$

For 1985–86,

$$\text{Percentage increase} = \frac{31 - 26}{26} \times 100$$

$$= \frac{5}{26} \times 100 = 19.23\%$$

Therefore, percentage increase in the contribution of the tertiary sector with respect to previous data given is maximum for 1960–61.

The correct answer is B.

262. By approximately what percentage did the N.D.P. increase between 1960–61 and 1985–86?

- (A) 135%  
(B) 147%  
(C) 160%  
(D) 178%  
(E) 180%

Percentage increase in N.D.P. between 1960–61 and 1985–86

$$= \frac{57,286 - 24,360}{24,360} \times 100$$

$$= 135\% \text{ (approx.)}$$

The correct answer is A.

263. By approximately how much (in crore rupees) did the contribution of the secondary sector to the N.D.P. increase from 1970–71 to 1980–81?

- (A) 3,800  
(B) 4,000  
(C) 4,550  
(D) 4,800  
(E) 4,950

Contribution of the secondary sector to the NDP in 1970–71 (approx.)

$$= \frac{17}{100} \times 34,519$$

= Rs. 5,868.23 crore

Contribution of the secondary sector to the NDP in 1980–81 (approx.)

$$= \frac{21}{100} \times 47,419$$

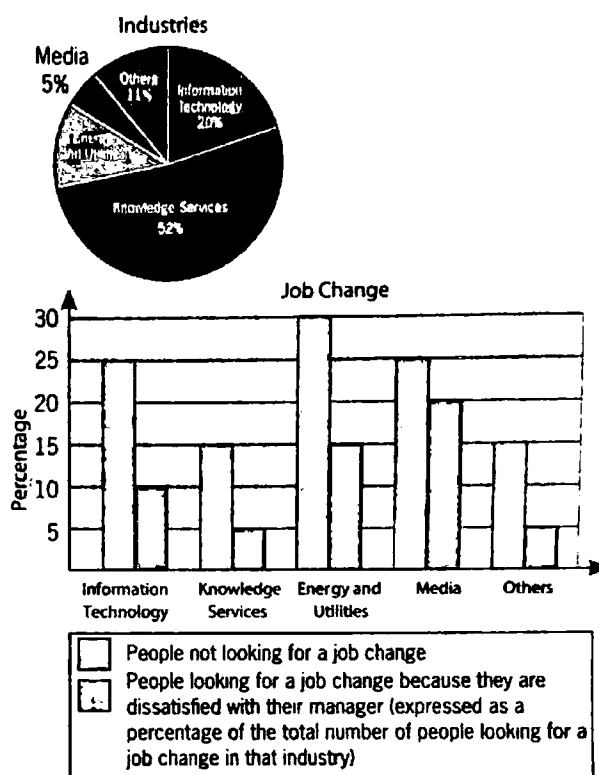
= Rs. 9,957.99 crore

Therefore, approximate increase in contribution of the secondary sector to the NDP from 1970–71 to 1980–81 (in crore rupees) = 5,868.23 – 9,957.99 = 4,089 ≈ 4,000

The correct answer is B.

Directions for Questions 264–267: A survey was conducted among 2,10,000 people employed in different industries. The graphs below show the results of the survey.

Go through the graphs and answer the questions based on them. (Real NMAT Question)



264. Out of the total number of people in the Information Technology industry who were looking for a job change for reasons other than dissatisfaction with their manager, 34% were looking for a job change because of low salary. How many people in the Information Technology industry were looking for a job change because of low salary?

- (A) 3,150  
(B) 4,200  
(C) 6,529  
(D) 8,350  
(E) 9,639

Total number of people surveyed = 2,10,000

Number of people surveyed from the Information Technology industry

$$= \frac{20}{100} \times 2,10,000 = 42,000$$

Number of people surveyed from Information Technology industry who were looking for a job change

$$= \frac{75}{100} \times 42,000 = 31,500$$

⇒ Number of people in the Information Technology industry who were looking for a job change for reasons other than dissatisfaction with their manager

$$= \frac{90}{100} \times 31,500 = 28,350$$

Number of people in the Information Technology industry were looking for a job change because of low salary

$$= \frac{34}{100} \times 28,350 = 9,639$$

The correct answer is E.

265. In the following year, for each industry the population remained the same, the percentage of people who were not looking for a job change increased by 5, and the percentage of people looking for a job change because of dissatisfaction with the manager remained the same. What is the approximate percentage decrease in the number of people looking for a job change because of dissatisfaction with the manager in the Knowledge Services?

- (A) 3.26%  
(B) 5.25%  
(C) 5.68%  
(D) 5.88%  
(E) 6.27%

In 1st year,

Total number of people surveyed = 2,10,000

Number of people surveyed from Knowledge Services industry

$$= \frac{52}{100} \times 2,10,000 = 1,09,200$$

Number of people surveyed from Knowledge Services industry who were not looking for a job change

$$= \frac{15}{100} \times 1,09,200 = 16,380$$

Therefore, number of people surveyed from Knowledge Services industry who were looking for a job change =  $1,09,200 - 16,380 = 92,820$

⇒ Number of people surveyed from Knowledge Services industry who were looking for a job change because of dissatisfaction with the manager

$$= \frac{5}{100} \times 92,820 = 4,641$$

In 2nd year,

Total number of people surveyed = 2,10,000

Number of people surveyed from Knowledge Services industry = 1,09,200 (same as in previous year)

Number of people surveyed from Knowledge Services industry who were not looking for a job change

$$= \frac{20}{100} \times 1,09,200 = 21,840$$

Therefore, number of people surveyed from Knowledge Services industry who were looking for a job change =  $1,09,200 - 21,840 = 87,360$

⇒ Number of people surveyed from Knowledge Services industry who were looking for a job change because of dissatisfaction with the manager

$$= \frac{5}{100} \times 87,360 = 4,368$$

Therefore, percentage decrease in the number of people looking for a job change because of dissatisfaction with the manager in the Knowledge Services

$$= \frac{4,641 - 4,368}{4,641} \times 100$$

$$= \frac{273}{4,641} \times 100 = 5.88\% \text{ (approx)}$$

The correct answer is D.

266. Based on the graphs, what was the average number of people across all the industries who were looking for a job change?

- (A) 22,820  
(B) 31,240  
(C) 33,894  
(D) 38,248  
(E) 41,209

In Knowledge Services industry,

Number of people surveyed

$$= \frac{52}{100} \times 2,10,000 = 1,09,200$$

Number of people surveyed who were looking for a

$$\text{job change} = \frac{85}{100} \times 1,09,200 = 92,820$$

In Energy and Utilities industry,

Number of people surveyed

$$= \frac{12}{100} \times 2,10,000 = 25,200$$

Number of people surveyed who were looking for a

$$\text{job change} = \frac{70}{100} \times 25,200 = 17,640$$

In Media industry,

Number of people surveyed

$$= \frac{5}{100} \times 2,10,000 = 10,500$$

Number of people surveyed who were looking for a

$$\text{job change} = \frac{75}{100} \times 10,500 = 7,875$$

In Information Technology industry,

Number of people surveyed

$$= \frac{20}{100} \times 2,10,000 = 42,000$$

Number of people surveyed who were looking for a

$$\text{job change} = \frac{75}{100} \times 42,000 = 31,500$$

In Other industries,

Number of people surveyed

$$= \frac{11}{100} \times 2,10,000 = 23,100$$

Number of people surveyed who were looking for a

$$\text{job change} = \frac{85}{100} \times 23,100 = 19,635$$

Average number of people surveyed who were looking for a job change for all industries

$$= \frac{92,820 + 17,640 + 7,875 + 31,500 + 19,635}{5}$$

$$= \frac{1,69,470}{5} = 33,894$$

The correct answer is C.

267. Among the people surveyed in each industry who were not looking for a job change, 80% were working in the same company for less than two years. Which industry had 6,048 people who were working in the same company for less than two years?

(Real NMAT Question)

- (A) Information Technology
- (B) Knowledge Services
- (C) Energy and Utilities
- (D) Media
- (E) Others

In Knowledge Services industry,

Number of people surveyed

$$= \frac{52}{100} \times 2,10,000 = 1,09,200$$

Number of people surveyed who were not looking for

$$\text{a job change} = \frac{15}{100} \times 1,09,200 = 16,380$$

Number of people surveyed who were working in the same company for less than two years

$$= \frac{80}{100} \times 16,380 = 13,104$$

In Media industry,

Number of people surveyed

$$= \frac{5}{100} \times 2,10,000 = 10,500$$

Number of people surveyed who were not looking for

$$\text{a job change} = \frac{25}{100} \times 10,500 = 2,625$$

Number of people surveyed who were working in the same company for less than two years

$$= \frac{80}{100} \times 2,625 = 2,100$$

In Information Technology industry,

Number of people surveyed

$$= \frac{20}{100} \times 2,10,000 = 42,000$$

Number of people surveyed who were not looking for

$$\text{a job change} = \frac{25}{100} \times 42,000 = 10,500$$

Number of people surveyed who were working in the same company for less than two years

$$= \frac{80}{100} \times 10,500 = 8,400$$

In Other industries,

Number of people surveyed

$$= \frac{11}{100} \times 2,10,000 = 23,100$$

Number of people surveyed who were not looking for

$$\text{a job change} = \frac{15}{100} \times 23,100 = 3,465$$

Number of people surveyed who were working in the same company for less than two years

$$= \frac{80}{100} \times 3,465 = 2,772$$

In Energy and Utilities industry,

Number of people surveyed

$$= \frac{12}{100} \times 2,10,000 = 25,200$$

Number of people surveyed who were not looking for

$$\text{a job change} = \frac{30}{100} \times 25,200 = 7,560$$

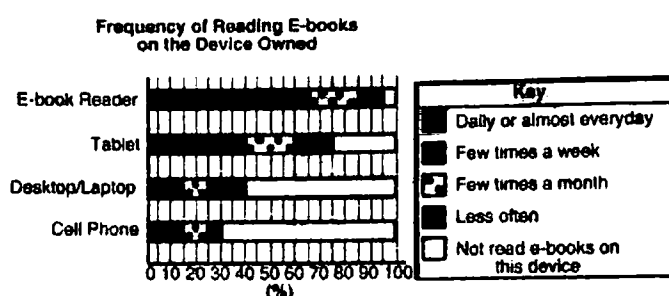
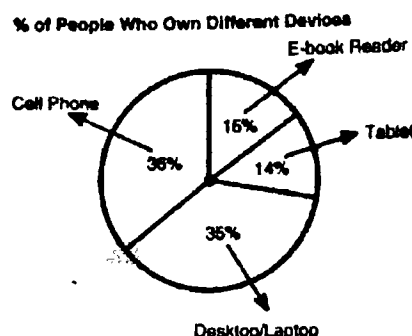
Number of people surveyed who were working in the same company for less than two years

$$= \frac{80}{100} \times 7,560 = 6,048$$

Therefore, Energy and Utilities industry had 6,048 people who were working in the same company for less than two years.

The correct answer is C.

**Directions for Questions 268–271:** In a survey, 21,000 people who were owners of different devices were asked how frequently they read e-books on the device they owned. Go through the given graphs and solve the question based on them. *(Real NMAT Question)*



268. What is the total number of cell phone and desktop/laptop owners who do not read e-books on the device they own?

- (A) 4,410  
(B) 5,292  
(C) 7,350  
(D) 7,560  
(E) 9,702

Total number of cell phone owners who do not read e-books on the device they own

$$= \frac{70}{100} \times 7,560 = 5,292$$

Total number of desktop/laptop owners = 7,350

Total number of desktop/laptop owners who do not read e-books on the device they own

$$= \frac{60}{100} \times 7,350 = 4,410$$

Total number of cell phone and desktop/laptop owners who do not read e-books on the device they own = 5,292 + 4,410 = 9,702

**The correct answer is E.**

269. What is the difference between the number of owners of tablets who read e-books on the tablet daily or almost every day and the number of owners of tablets who read e-books less often on a tablet?

- (A) 294  
(B) 325  
(C) 441  
(D) 524  
(E) 735

Number of owners of tablets who read e-books on the tablet daily or almost every day

$$= \frac{25}{100} \times 2,940 = 735$$

Number of owners of tablets who read e-books less often on a tablet =

$$= \frac{15}{100} \times 2,940 = 441$$

Therefore, required difference = 735 – 441 = 294

**The correct answer is A.**

270. Of the total number of people who read e-books a few times a month on the device they own, approximately what percentage use their tablet to read e-books a few times a month?

- (A) 21.71%  
(B) 28.48%  
(C) 32.46%  
(D) 38.64%  
(E) 45.82%

Number of people who own cell phone

$$= \frac{36}{100} \times 21,000 = 7,560$$

Number of people who own desktop/laptop

$$= \frac{35}{100} \times 21,000 = 7,350$$

Number of people who own e-book reader

$$= \frac{15}{100} \times 21,000 = 3,150$$

Number of people who own tablet

$$= \frac{14}{100} \times 21,000 = 2,940$$

Number of cell phone owners who read e-books a few times a month

$$= \frac{10}{100} \times 7,560 = 756$$

Number of e-book reader owners who read e-books a few times a month

$$= \frac{20}{100} \times 3,150 = 630$$

Number of tablet owners who read e-books a few times a month

$$= \frac{20}{100} \times 2,940 = 588$$

Number of desktop/laptop owners who read e-books few times a month

$$= \frac{10}{100} \times 7,350 = 735$$

Total number of people who read e-books few times a month on the device they own

$$= 756 + 630 + 588 + 735 = 2,709$$

Number of people who use tablet to read e-books few times a month

$$= 588$$

$$\text{Required percentage} = \frac{588}{2,709} \times 100 = 21.71\% \text{ (approx.)}$$

The correct answer is A.

271. If  $\frac{2}{3}$  of the total number of people who read e-books less often on cell phones, e-book readers and tablets read e-books on these three devices only once a year, how many people read e-books on these three devices only once a year?

- (A) 582  
(B) 624  
(C) 756  
(D) 1,134  
(E) 2,940

Total number of people who read e-books 'less often' on cell phones, e-book readers and tablets  
 $= 378 + 315 + 441 = 1,134$

Therefore, Number of people who read e-books on these three devices only once a year

$$= \frac{2}{3} \times 1,134 = 756$$

The correct answer is C.

272. In a school exhibition, hand-made crafts are displayed for sale. Some students are assigned the work of selling crafts. The overall profit  $p$  depends on the number of students  $x$  selling the crafts on that particular day and is given by the equation  $p = 250x - 5x^2$ . The school manager claims to have made a maximum profit. Find the number of students engaged in selling the crafts and the maximum profit made. (Real NMAT Question)

- (A) 25 and Rs. 1,800  
(B) 25 and Rs. 2,900  
(C) 25 and Rs. 3,125

(D) 30 and Rs. 3,900

(E) 34 and Rs. 4,000

For profit to be maximum, the derivative of  $p$  with reference to  $x$  must be 0 and hence

$$\frac{d(250x - 5x^2)}{dx} = 0$$

$$250 - 10x = 0$$

So,  $x = 25$

Now  $p$  for  $x = 25$  is

$$250(25) - 5(25)^2 = \text{Rs. } 3,125$$

The correct answer is C.

Directions for Questions 273–276: Refer to the following table and answer the questions that follow:

Number of trousers produced by 5 factories over 5 months of 2016.

Month	Prisma	Shelby	Kooper	Wendy	Caret
Jan	900	850	350	1000	850
Feb	800	700	1050	1100	850
Mar	1050	800	1000	1100	950
Apr	800	850	850	1100	850
May	950	900	1050	1150	850
Total	4500	4100	4900	5450	4350

273. For which factory was the number of trousers manufactured in March the highest percentage of the total number of trousers produced by that factory during the five-month period?

- (A) Prisma  
(B) Shelby  
(C) Kooper  
(D) Wendy  
(E) Caret

$$\text{The required percentage for Prisma} = \frac{1050}{4500} \times 100 = \text{approximately } 23\%$$

$$\text{The required percentage for Shelby} = \frac{800}{4100} \times 100 = \text{approximately } 19\%$$

$$\text{The required percentage for Kooper} = \frac{1000}{4900} \times 100 = \text{approximately } 20\%$$

$$\text{The required percentage for Wendy} = \frac{1100}{5450} \times 100 = \text{approximately } 20\%$$

The required percentage for Caret =  $\frac{950}{4350} \times 100 =$   
approximately 22 %

The correct answer is A.

274. The number of trousers manufactured by Wendy in April is what percentage of the number of trousers manufactured by Wendy in January?

- (A) 10%
- (B) 91%
- (C) 110%
- (D) 115%
- (E) 125%

The required percentage =  $\frac{1100}{1000} \times 100 = 110\%$

The correct answer is C.

275. Which of the five factories has the highest ratio of the number of trousers manufactured in April to number of trousers manufactured in February?

- (A) Prisma
- (B) Shelby
- (C) Kooper
- (D) Wendy
- (E) Caret

While you can try calculating the required ratio for all the companies to get to the answer, the faster way to calculate this question is to look at the figures for the companies for April and February. Only in the case of Shelby is the April figure greater than the February figure. Thus, the highest ratio has to be that of Shelby.

The correct answer is B.

276. For which factory was the number of trousers manufactured in February and March together the lowest among the five factories?

- (A) Caret
- (B) Wendy
- (C) Kooper
- (D) Shelby
- (E) Prisma

The number of trousers manufactured in February and March by Caret =  $850 + 950 = 1800$

The number of trousers manufactured in February and March by Wendy =  $1150 + 1100 = 2200$

The number of trousers manufactured in February and March by Kooper =  $1050 + 1050 = 2050$

The number of trousers manufactured in February and March Shelby =  $700 + 800 = 1500$

The number of trousers manufactured in February and March by Prisma =  $1050 + 800 = 1850$

The correct answer is D.

**Directions for questions 277-281:** Each question is followed by two statements, I and II. Answer the questions based on the statements and mark the answer as follows:

- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

277. In how much time will the work get completed if 15 men work for 8 hours (h) every day?

- I. Twenty women working for 7 h can do the work in 12 days.
- II. Eight men working for 15 h can do the work in 18 days.

The question cannot be answered by using statement I alone because we do not know the efficiency comparison of a man and a woman.

Using statement II alone and equating the total work to be done, we have

$$8 \times 15 \times 18 = 15 \times 8 \times y$$

Solving, we get  $y = 18$  days

The correct answer is B.

278. Radha and Rani took an examination. What was the total number of questions?

- I. Radha and Rani together solved 20% of the paper.
- II. Radha alone solved  $\frac{5}{3}$  of the paper solved by Rani.

Using statement I, we know that both of them together solved 20% of the paper, but we cannot tell the number of questions in the examination.

Using statement II, if Rani solved  $x$  questions, Radha solved  $\frac{5x}{3}$  questions. They would together solve

$x + \frac{(5x)}{3} = \frac{8x}{3}$  questions, but we do not know the number of questions in the examination. Using both the statements together, we still cannot find out the number of questions.

The correct answer is E.

279. What is the price of tea?

- I. The price of coffee is Rs. 5 more than that of tea.
- II. The price of coffee was Rs. 5 less than the price of a cold drink, which cost three times the price of tea.

Using statement I alone, we can say that the price of coffee =  $x + 5$ , where  $x$  is the price of tea.

Using statement II alone, we know that the price of coffee =  $3x - 5$ , where  $x$  is the price of tea.

Combining both the statements, we have

$$\begin{aligned}x + 5 &= 3x - 5 \\2x &= 10 \Rightarrow x = 5\end{aligned}$$

The correct answer is C.

280. Is  $n$  a positive number?

- I.  $4n > 5n$
- II.  $n + 6$  is positive.

Statement 1 will only be true if  $n$  is a negative number. In case you are confused, you can actually pick some numbers and try for yourself.

Statement 2 is not sufficient because the value of  $n$  could be positive or negative, so it is NOT sufficient.

The correct answer is A.

281. What is the cube root of  $y$ ?

- I. The 7<sup>th</sup> root of  $y$  is 12.
- II. The 22<sup>nd</sup> root of  $y$  is 2.

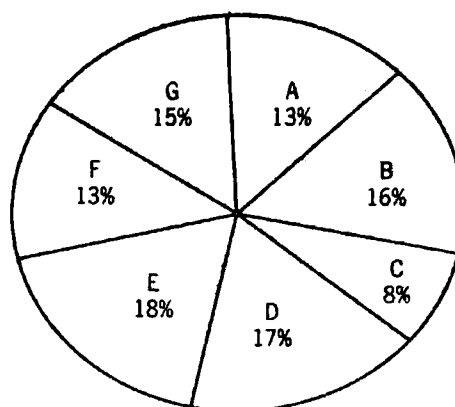
You don't need to actually calculate the 7<sup>th</sup> and 22<sup>nd</sup> roots of  $y$ ; doing so will only waste your time. However, the important thing to note is that you will get a unique value for  $y$  from either of the two given statements. What that value is does not matter to you. Thus, the answer is D.

The correct answer is D.

Directions for Questions 282–285: Study the following chart to answer the question given below:

Town	% of the population below the poverty line
A	45
B	52
C	38
D	58
E	46
F	49
G	51

Percentage distribution of the population of seven towns of the state in 2005.



282. In 2006, the populations of Town A and Town B each increased by 10% as compared to 2005. If the population of Town A in 2005 was 5000 and the percentage of the population living below the poverty line for all seven towns in 2006 remains the same as in 2005, which of the following is the approximate population of Town B below the poverty line in 2006?

- (A) 2500
- (B) 3000
- (C) 3500
- (D) 4000
- (E) 4500

The population of B in 2005 =  $5000 \times \frac{16}{13} =$   
approximately 6150

The population of B in 2006 =  $6150 \times \frac{16}{13} =$   
approximately 6750

The population below poverty line = 52% of 6750 =  
approximately 3500

The correct answer is C.

283. In 2007, the population of Town D increased by 10% as compared to 2005 and the population of



Town G reduced by 5% as compared to 2005. If the population of Town G in 2005 was 9000, what is the total population of Towns D and G in 2007?

- (A) 19200
- (B) 19770
- (C) 19870
- (D) 19970
- (E) None of these

$$\begin{aligned}\text{The population of Town D in 2005} &= 9000 \times \frac{17}{15} \\ &= 10200\end{aligned}$$

$$\begin{aligned}\text{The population of Town D in 2007} &= 10200 \times \frac{110}{100} \\ &= 11220\end{aligned}$$

$$\begin{aligned}\text{The population of Town G in 2007} &= 9000 \times \frac{95}{100} \\ &= 8550\end{aligned}$$

$$\begin{aligned}\text{Therefore, the required total} &= 11220 + 8550 \\ &= 19770\end{aligned}$$

The correct answer is B.

284. If in 2005 the total population of the seven towns together was approximately 55,000, what will be the approximate population of Town F in that year below the poverty line.

- (A) 2500
- (B) 3000
- (C) 3500
- (D) 4000
- (E) 4500

The population of Town F below the poverty line

$$= \frac{5500}{100} \times \frac{13}{100} \times \frac{49}{100} = 3500$$

The correct answer is C.

285. The population of Town C is 2000 in 2005. What will be the ratio of the population of Town C below the poverty line to that of Town E below the poverty line in that year?

- (A) 207 : 76
- (B) 76 : 207
- (C) 152 : 207
- (D) 76 : 307
- (E) 87 : 207

$$\begin{aligned}\text{The population of Town C below the poverty line} &= 2000 \times \frac{38}{100} = 760\end{aligned}$$

$$\begin{aligned}\text{The population of Town E below the poverty line} &= \frac{2000}{8} \times 18 \times \frac{46}{100} = 2070\end{aligned}$$

$$\begin{aligned}\text{Therefore, the required ratio} &= 760:2070 \\ &= 76:207\end{aligned}$$

The correct answer is B.

286. The average of five consecutive integers is 20. What is the average of the first 3 of these integers?

- (A) 15
- (B) 17
- (C) 18
- (D) 19
- (E) 21

We know that the average of consecutive integers is always the middle value. So, if the average is 20, the integers are 18, 19, 20, 21, 22.

So, the first 3 integers in this list are 18, 19, 20 whose average will again be the middle value, that is, 19.

The correct answer is D.

**Direction for Questions 287–292:** Each question is followed by two statements, 1 and 2. Answer the questions based on the statements and mark the answer as follows:

- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

287. In triangle ABC, if AB = x units, BC = x + 4 units, and AC = y units, which of the three vertex angles of triangle ABC has the greatest degree measure?

- I.  $y = x + 8$
- II.  $x = 4$

You know that in a triangle, the largest angle lies opposite to the longest side. So all we need to figure out is which of the three sides is the longest.

From Statement 1, AC is the longest side, so it is Sufficient.

From Statement 2, we still don't have a value for y. So it is NOT Sufficient.

The correct answer is A.

288. How many factors does the number N have?

- I. N is the square of an odd natural number and N is less than 50.

II.  $N = 2^2 \times 3^1$

Statement 1 will give a number of possible values, that is, 1, 9, 25 and 49.

Using statement 2 alone, we can find out the number of factors.

The correct answer is B.

289. How many students among A, B, C and D have passed the examination?

- The following statement is true: A and B passed the examination.
- The following statement is false: At least one among C and D has passed the examination.

Using statement 1 alone, we cannot answer the question asked as we do not know about the status of C and D.

Using statement 2 alone, we can definitely say that both C and D have not passed the examination but we cannot answer the question asked as we do not know the status of A and B.

Combining both the statements, we can definitely say that A and B have passed the examination.

The correct answer is C.

290. What percentage of Debating club members enrolled at a certain school are from India?

- Of the Indian students enrolled at the school, 20% are members of the Debating club.
- Of the non-Indian students enrolled at the school, 45% are members of the Debating club.

You can't do anything with either of the two statements because the total number of students is not given to you, neither is the ratio of Indian to non-Indian students given.

The correct answer is E.

291. If the sequence S has 150 terms, what is the 121<sup>st</sup> term of S?

- The first term of S is 32.
- The 138<sup>th</sup> term of S is 1248, and each term of S after the first is 18 more than the preceding term.

Statement 1 is not sufficient since it does not provide us with the Common difference.

Statement 2 is Sufficient because it provides us with the common difference (18) and also with one specific term.

The correct answer is B.

292. Find the value of the two-digit number.

- The sum of the digits is 11.
- The sum of the number and its reverse is also divisible by 11.

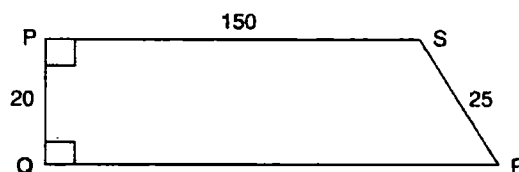
Using statement 1 alone, there will be more than one value that satisfies the given condition, for example, 65, 56, 74, 47, 83, 38, 92, 29.

Statement 2 is universally correct and it will be true for every two-digit number, and therefore statement 2 does not provide any additional data.

Combining both the statements, we will not be able to find any unique value that satisfies the condition given.

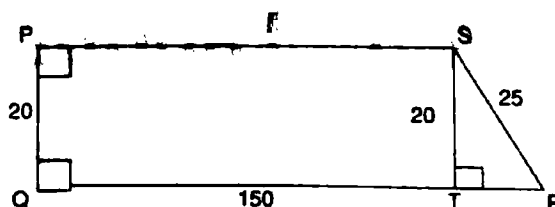
The correct answer is E.

293. In the figure given,  $PS \parallel QR$ . What is the perimeter of the quadrilateral PQRS?



- 320
- 345
- 360
- 380
- 400

Make a right triangle inside the figure by dropping a perpendicular ST from S to QR as shown in the figure given.



Now,  $PQ = ST = 20$

So, use Pythagoras' theorem to find the length of TR

$$SR^2 = ST^2 + TR^2$$

$$25^2 = 20^2 + TR^2$$

$$TR^2 = 625 - 400$$

$$TR = \sqrt{225} = 15$$

So, the perimeter of the figure PQRS =  $20 + 150 + 15 + 25 + 150 = 360$ .

The correct answer is C.

224

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## 4.0 Language Skills Review

Although this section provides a review of some of the important language skills concepts, this is not intended to be a textbook. You should use this chapter to familiarise yourself with the kinds of topics that may be tested in the NMAT by GMAC™ exam, as well as the strategies that can be used to approach them.

The Language Skills section of the NMAT by GMAC™ exam will test you on the following three broad areas:

1. Vocabulary
2. Grammar
3. Comprehension

The question types that you can expect to see within each of these areas are:

### Vocabulary

1. Synonyms
2. Antonyms
3. Analogies
4. Fill in the Blanks
5. Cloze Test

### Grammar

1. Identify the Error
2. Choose the Correct Preposition

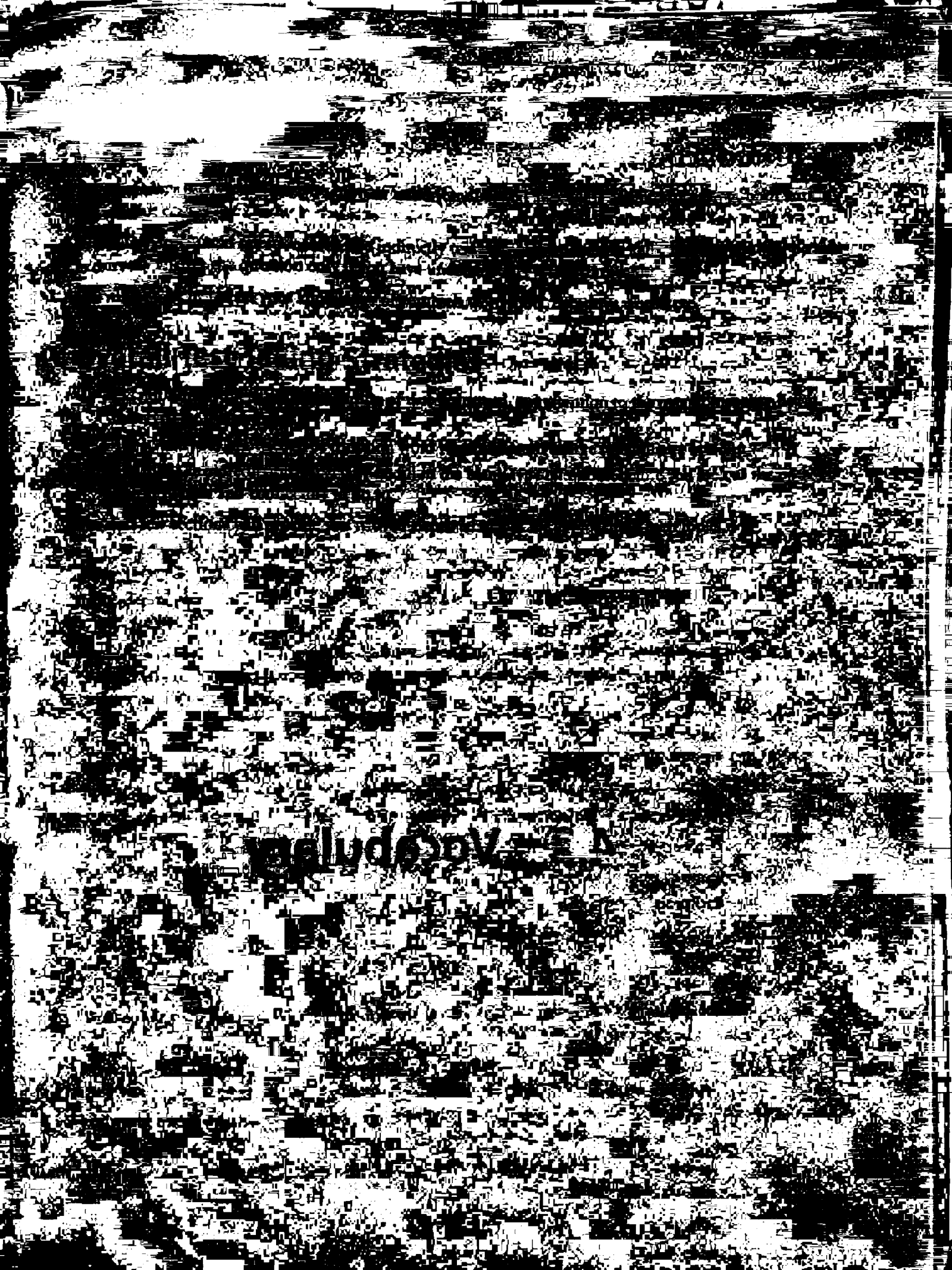
### Comprehension

1. Reading Comprehension
2. Parajumbles

The next few sections will explain some of the important strategies to approach each of these question types and include some practice questions at the end.

## 4.1 Top Tips to Prepare for Language Skills

1. You will get 32 questions in the Language Skills section on the NMAT by GMAC™ exam, that you will have to attempt in 22 minutes.
2. This section will test you on all three areas of English— vocabulary, grammar and comprehension.
3. Manage your time carefully. You have an average of 40 seconds per question, but you will need some more time while attempting Reading Comprehension questions. So, your target should be 30 seconds each for the rest of the questions, which will give you around 10–11 minutes to attempt the 7–8 Reading Comprehension questions that will appear on the test.
4. Practice makes perfect—ensure that you practice enough test questions to get your timing correct. This is particularly important for grammar questions as you will need to remember the important grammar rules.
5. More importantly, maintain an error log of your practice questions and go through it from time to time to identify and strengthen your weak areas.
6. To improve both your comprehension and vocabulary, start reading well-written books, or a good newspaper, every day. Pay special attention to the Editorial section of newspapers, which has the most enriching vocabulary.
7. Maintain a vocabulary diary. Write down any new word you come across while reading the newspaper, or attempting practice questions in this diary, and go through it every day.
8. Try to learn words and not just memorise them. Simply put, you should be aware of the usage of a word and not just its dictionary meaning.
9. Prefer quality over quantity. Instead of memorising 100 words haphazardly, learn the meaning of 20 words properly. Similarly, instead of practicing a huge number of grammar questions, focus on a small number of questions and try to understand why you are making the mistakes that you are making and how to correct them in subsequent practice sessions.
10. Pay close attention to the strategies given in the next few sections to help you make intelligent guesses about meaning and usage of words. With these strategies, you do not need to know the meaning of every word in the dictionary.
11. Make no assumptions and do not use any real-world knowledge, especially on Reading Comprehension questions.



## 4.2 Vocabulary

## 4.3 What is Measured?

The vocabulary section will test you on your understanding and awareness of word meanings, both within and without context.

Vocabulary-in-context questions will also indirectly test your comprehension skills because you will be able to correctly answer the question only if you have understood its intended meaning.

You will also be tested on your knowledge of common word roots, deceptive words, etc.

## 4.4 Overall Test Taking Strategies

- Do not blindly focus on the meaning of words; instead, pay attention to the overall meaning being conveyed by the sentence.
- Try to use your knowledge of common word roots and word charge to eliminate options.
- Try to make a prediction, especially on fill in the blank type questions, before you look at the options. Use keywords and connectors to do so.

The next few sections will provide you with in-depth strategies for approaching each topic.



# 1 Introduction

Vocabulary questions tested on the NMAT by GMAC™ can be of two types—those testing you on plain and simple vocabulary and those testing you on vocabulary within context. While simple vocabulary questions—synonyms, antonyms and analogies—test your knowledge of word meanings, vocabulary in context questions—fill in the blank and cloze test questions—go one step further and test your comprehension ability as well.



**Important Learning:** Fill in the blank questions test you as much on comprehension as on vocabulary. So, always pay attention to the meaning of the given sentence.

## 2 Synonyms and Antonyms

The root 'onym' means *name* and the root 'syn' means *same*, so, synonym literally means 'same name'.

Similarly, the root 'anti' means *opposite*, so, antonym means 'opposite name'.

In synonym questions you need to select a word from the given options that is closest in meaning to the word given in the question stem, and in antonym questions you need to select a word from the given options that is opposite in meaning to the word given in the question stem.

For example,

1. Find the synonym of WRATH from the given options.

- (A) Dislike
- (B) Guilt
- (C) Garland
- (D) Anger
- (E) Sorrow

WRATH means extreme anger; so, the correct answer is (D).

2. What is the antonym of LUMINOUS?

- (A) Shiny
- (B) Radiant
- (C) Dark
- (D) Angry
- (E) Jubilant

LUMINOUS means shiny or giving out light. Thus, the opposite should mean lacking light or dark. So, (C) should be the correct answer.

As you can see, the knowledge of word meaning is very important for these questions. However, even if you do not know the meaning of some of the given words, there are certain tips that can at least help you narrow down your choices.

### Knowledge of root words

You would have seen earlier that we broke up the words *synonym* and *antonym* into their respective roots to explain their meaning. If you are aware of some common roots, this can at least help you eliminate some of the options.

For example, let us say the question asks you to select the antonym of BENIGN from the following options:

- (A) Syncretism
- (B) Favourable
- (C) Malevolent
- (D) Acrid
- (E) Verbose

Now, even if you do not know the meaning of 'benign', if you are aware that its root '*bene*' means *good* (think *beneficial*, *benevolent*, etc.), then you immediately know that the antonym will be a negative word signifying *harmful* or something along those lines.

If you are aware that the root '*mal*' means something negative or harmful (think *malignant*, *malnutrition*, etc.), then you can immediately select (C) as the correct answer, even if you do not know the meaning of *malevolent*. At least, you can definitely eliminate option (B), which is more of a synonym of benign. You can also eliminate option (A) because '*syn*' means *same*, and it is extremely unlikely that something with *same* will mean *harmful*. So, the knowledge of root words can help you eliminate options or even take you to the correct answer.



**Important Learning:** Knowledge of some common root words can greatly improve your chances of answering vocabulary questions correctly.

### Knowledge of word charge

Words can have a positive charge (a positive meaning), a negative charge (a negative meaning) or a neutral charge (neutral meaning). If you can identify the type of charge your word has, you can again narrow down your choices.

For example, let us say the question asks you to select the synonym of FRACTIOUS from the following options:

- (A) Obedient
- (B) Loyal
- (C) Perseverant
- (D) Unruly
- (E) Virulent

Now, you may not be aware of the exact meaning of FRACTIOUS, but you may have heard of it being used somewhere in the negative sense. Then, you know that the synonym will also be a negative word, in which case you can immediately eliminate options (A), (B) and (C) because they are all positive words. So, you now have a 50% chance of getting the answer correct because you have managed to come down to two options.

The correct answer here is (D) because *fractious* means disobedient or difficult to control.

### Identify a relation between some of the options

Let us say the question asks you to select the antonym of REFULGENT from the following options:

- (A) Radiant
- (B) Distant
- (C) Dull
- (D) Glowing
- (E) Noisy

Now, most likely you would not know the meaning of REFULGENT. However, you will notice that two of the options—radiant and glowing—are in fact synonyms. Then, there is no way that these two can be your answer because they mean the same thing and you obviously cannot have two answers to the question. Thus, even without knowing the meaning or charge of the word in question, you have managed to eliminate two options.

The correct answer, is (C) because *refulgent* means shiny or glowing, so *dull* is the antonym of refulgent.

The lesson here is that you can get to the correct answer even if you do not know the meaning of every given word. However, it definitely helps if you have a good vocabulary. So, go through the word list given at the end of this section and try to remember as many of those words as you can.

## 3 Analogies

In analogy questions, as tested on the NMAT by GMAC™, you will be given a pair of words in the question stem that will have some relation between them. You need to select a pair of words from the given choices that express the same relation as between the words in the question stem.

### 1. TRICKLE: GUSH

- (A) Run: Walk
- (B) Rise: Collapse
- (C) Puppy: Dog
- (D) Sip: Gulp
- (E) Room: Window

Keep in mind that in an analogy question, there will always be some connection between the words given to you in the question stem. The first step is to identify that link or connection; let's call this making a bridge. Once you have made this bridge, plug your answer choices into this bridge and identify the answer choice for which this bridge holds true. That is your answer.

So, in the above question, trickle means to fall slowly, whereas gush means to fall rapidly. Thus, the bridge between the two words can be *to gush is to trickle quickly*.

Now, let's try to plug in our answer choices in this bridge.

1. To walk is to run quickly? No. In fact, the opposite is true. Remember that since you have made your original bridge starting with the second word (*gush*), you should do the same while plugging the answer choices into this bridge. So, you need to start with the second word 'walk' and not with the first word 'run'.
2. To collapse is to rise quickly? Absolutely not. These are, in fact, antonyms.
3. To dog is to puppy quickly? Makes no sense.

4. To *gulp* is to *sip* quickly? Yes! This option matches our original bridge perfectly and should be the correct answer.
5. To *window* is to *room* quickly? Makes no sense.

Hence the correct answer is (D).



**Important Learning:** Make sure you plug into the answer choices in the same order as in the original bridge. So, if you have started with the second word in the original bridge, start with the second word while plugging in the answer choices and vice versa.

Thus, the key in any analogy question in NMAT by GMAC™ is to make the original bridge correctly. Some common bridges that you may encounter include cases in which the two words are antonyms of one another (rise: collapse) or in which one word is a higher degree of the other (joy: euphoria).

## 4 Fill in the Blank Questions

As the name suggests, these questions will consist of a sentence or a group of sentences containing one or two blanks. There will be some options given to you for each blank and you will need to select the correct word from those options that can be put into that blank.

The key thing to keep in mind is that the word that goes into the blank(s) cannot be a figment of your imagination; rather, it has to make sense with the meaning conveyed by the rest of the sentence. This is where the comprehension part comes in. **By giving these fill in the blank questions on the test, the NMAT by GMAC™ is not just testing you on vocabulary but also on comprehension.**

To comprehend or understand the meaning of the sentence, you should always try to look for two kinds of clues:

1. Keywords
2. Connectors

**Keywords** are words that tell you the meaning of the word that can go into the blank.

For example, consider this sentence:

Known for their valour, horses are used as symbols of \_\_\_\_\_ in several cultures.

- (A) arrogance
- (B) courage
- (C) fidelity
- (D) speed
- (E) stamina

The correct answer should be (B), courage. But why can the answer not be (C), fidelity? Because the sentence talks about horses being known for their 'valour', that is, courage; so, 'valour' becomes your keyword in this sentence. Hence, even though horses are also known for fidelity, speed and stamina, the answer still has to be *courage* because it is connected to the keyword in the sentence.

**Remember that in NMAT by GMAC™ the Keyword does not necessarily have to be a word; it can also be a phrase or a clause.**

If valour were to be replaced with 'devotion' in the original sentence, then what should be the answer?

Known for their devotion, horses are used as symbols of \_\_\_\_\_ in several cultures.

The answer will then change to 'fidelity', that is, loyalty, because the keyword now becomes 'devotion'. This is how keywords can help you decide which word goes into the blank. So, you must consciously look for the keyword in every sentence that you see.

However, sometimes the keyword, on its own, may not be enough to convey the entire meaning of the sentence. For example, consider a variation of the above sentence:

Although horses are known for their devotion, in some cultures they are used as symbols of \_\_\_\_\_

- (A) arrogance
- (B) courage
- (C) fidelity
- (D) speed
- (E) treachery

The keyword is still 'devotion', but the meaning of the sentence has reversed because of the use of 'although'. We call such words *connectors* because they help you determine the connection between two parts of a sentence—whether they are connected in the same manner or in a contrasting manner.

In the above example, the word that goes into the blank has to contrast with the keyword 'devotion', so the answer should actually be 'treachery'.

Here is a list of some 'contrasting' and some 'same-direction' connectors commonly used on the NMAT by GMAC™:

**Same Direction Connectors:**

1. Because
2. Since
3. And
4. Hence
5. As a result of
6. Also
7. Due to
8. Thus
9. Likewise
10. Moreover
11. Consequently
12. Additionally
13. ; (the semicolon is also a same direction connector)


**Contrasting Connectors:**

1. Despite
2. Yet
3. But
4. However
5. Nonetheless
6. Nevertheless
7. Paradoxically
8. While

9. Although
10. Ironically
11. Rather
12. Contrastingly

Note that every sentence may not necessarily have a Connector. In such sentences, the thought, obviously, always goes in the same direction.

**Exception**—Sometimes, the connector itself may have to be put into the blank. If you see some typical connectors in the list of options, then check whether the sentence is actually implying a contrast or going in the same direction.

 **Important Learning:** Look out for Keywords and Connectors while attempting Fill in the blank questions.

To summarise, in every 'Fill in the blank' type question, you always look for two kinds of clues—the keyword, which has to be present in every sentence, and the connector, which may or may not be present in every sentence.

Let us now take a look at how a two-blank question looks:

1. John is a \_\_\_\_\_, so he always tends to \_\_\_\_\_ discussions rather than take action.
  - (A) mediator : eschew
  - (B) vagabond : encourage
  - (C) charlatan : delay
  - (D) procrastinator : prolong
  - (E) neophyte : discourage

**Keyword**—take action

**Connector**—rather (contrast)

The Keyword suggests that the second blank should contrast with the taking action. Also the first blank should describe such a person.

**Prediction for Blank 1**—lazy person

**Prediction for Blank 2**—encourage

*Procrastinator* and *prolong* come closest to our prediction and should be the correct answer.

In a two-blank question, you should make a prediction for whichever blank looks easier to you and use this to eliminate some options. For example, in the above question if you can figure out that the word that goes in the second blank should mean 'encourage', then option (E) can immediately be eliminated, even if you do not know the meaning of 'neophyte'. Similarly, if you can predict that the first blank should mean a lazy person, then option (A) can immediately be eliminated, even if you do not know the meaning of 'eschew'. Thus, in a two-blank question, you should use individual blanks to eliminate some options. Do not check both the blanks for each option as this is a waste of time.

The correct answer is (D).

Remember that no partial credit will be given for getting one blank correct on the NMAT by GMAC™; you will be marked correct only if you get both the blanks correct in a sentence.

### Tips to keep in mind when attempting Fill in the Blank Questions:

1. **Have an answer in mind before you look at the options**—It is always a good idea to have an answer in mind before you look at the options. At least, you should be able to predict whether the word will be a positive or a negative one or whether there should be some kind of a relation between the words in a multiple blank sentence.  
This strategy will also help you assess whether you are able to understand the meaning of the sentences correctly. If your predictions are correct but your actual answer is wrong, then you need to work on your vocabulary; but if your prediction itself is incorrect, then even if you know all the words, you will not get the answer right. In this case, you will need to start working on your comprehension skills.
2. **Start with whichever blank looks easier**—In a two-blank question, it is not necessary that you always start predicting for the first blank. Actually, in most cases, it will be easier to predict an answer for the second blank. Use your prediction for one blank to eliminate some options immediately.
3. **Avoid synonyms**—If you see a pair of synonyms or similar words in a table, these will most likely not be the answer; so, go with one of the other options instead. For example, if some of the options given to you are joy, happiness and salubrious, then you should go with *salubrious* (even if you do not know its meaning) because joy and happiness almost mean the same, whereas there can be only one correct answer for the blank.

## 5 Cloze Test

A cloze test is a special type of text completion question tested on the NMAT by GMAC™ in which you are given a short paragraph from which certain words have been removed and blanks have been put in their place.

For each blank, you have some options given from which you need to select the correct answer for that blank. As you can see, it is very similar to a regular text completion question. The only difference is that, instead of a sentence, you have an entire paragraph to work with and comprehend, and the number of blanks also generally tends to be higher—five or six blanks.

Here is an example of a cloze test:

Most businesses \_\_\_\_\_ loans for their normal operations. When the banking sector does not work properly, businesses cannot get loans and they have to \_\_\_\_\_ their production and lay off workers. As they cut production, businesses demand \_\_\_\_\_ products from their suppliers, and therefore their suppliers have to reduce their output and fire workers. Eventually, some of these businesses go bankrupt and banks experience further problems as their balance sheet \_\_\_\_\_ due to non-performing loans. At this point, banks want to lend even less because of the uncertainty generated from bankruptcies. As they lend less, the vicious circle \_\_\_\_\_ with producers cutting production and firing even more workers.

1. (A) eschew  
(B) forbid  
(C) require  
(D) dislike  
(E) apply

2. (A) stop  
(B) curtail  
(C) increase  
(D) release  
(E) begin
3. (A) more  
(B) fewer  
(C) expensive  
(D) cheaper  
(E) varied
4. (A) strengthens  
(B) diversifies  
(C) deteriorates  
(D) collapses  
(E) migrates
5. (A) continues  
(B) ends  
(C) changes direction  
(D) broadens  
(E) cuts down

(Answers: 1-C, 2-B, 3-B, 4-C, 5-A)



**Important Learning:** On NMAT by GMAC™ vocabulary questions, you do not need to know the meaning of every word. You can use the knowledge of word charge, word roots and other intelligent strategies to eliminate options and arrive at the correct answer.



## 6 NMAT by GMAC™ Word List

As you can see, vocabulary will comprise a large chunk of the questions you will see on NMAT by GMAC™ verbal section.

While there is no end to the number of words you can learn, to start with here is a list of 1000 words commonly tested on the NMAT by GMAC™. Of course, this is not a foolproof list and you will, almost certainly, see words from outside this list on the test. But, as a first step, it is a good idea to start with this list. Once you have learnt these words you can easily learn more words beyond this list.

Remember that consistency is the most important thing when it comes to expanding your vocabulary. We suggest that you start with a small number of words every day—say 20 words or so—and then gradually increase this number. If you progress at the rate of 20 words a day you will have completed all 1000 words in just 50 days!



**Important Learning:** While learning words, aim for quality and not quantity. If you study words consistently, you will be able to learn a lot of words in relatively less time.

### High Frequency Words:

#### A

Abase	lower; degrade; humiliate
Abash	make (someone) feel embarrassed, disconcerted or ashamed
Abate	to reduce in amount, degree or intensity; lessen
Abdicate	to relinquish (power or responsibility) formally
Abet	assist, usually in doing something wrong; encourage
Abhorrent	one that is hated; disgusting, loathsome or repellent
Abjure	to renounce, repudiate, retract or give up, usually under oath
Abnegation	renunciation; self-sacrifice
Abominable	detestable; extremely unpleasant
Abortive	unsuccessful; fruitless
Abridge	condense or shorten
Absolve	pardon (an offense)
Abstemious	exercising moderation and self-restraint in appetite and behaviour
Abstruse	difficult to understand; recondite
Abut	to touch at one end or side; lie adjacent
Abyss	an immeasurably deep chasm, depth or void
Accolade	an expression of approval; praise
Acerbic	sour or bitter tasting; acidic
Acme	the highest point, as of achievement or development
Acquiesce	assent; agree passively; comply without protest
Acumen	shrewdness shown by keen insight
Acquit	free from a charge or accusation

Acrimony	bitter ill-natured animosity in speech or behaviour
Adage	wise saying; proverb
Admonish	take to task; to criticise for a fault
Advocate	support or push for something
Aegis	protection; endorsement; guidance
Aesthetic	concerning or characterised by an appreciation of beauty or good taste
Affectation	a deliberate pretense or exaggerated display
Aggress	take the initiative and go on the offensive
Alacrity	liveliness and eagerness
Alleviate	to lessen the pain; to make something better
Altruism	the quality of unselfish concern for the welfare of others
Ambiguous	open to two or more interpretations; of uncertain nature or significance
Ambrosial	worthy of the gods; highly pleasing to the senses—especially that of taste
Ameliorate	to make better
Amenable	disposed or willing to comply
Amnesty	a general pardon granted by a government, especially for political offenses
Anachronism	from an incorrect time period
Anarchy	a state of lawlessness and disorder
Anathema	a damnation or a curse
Animadversion	harsh criticism or disapproval
Antediluvian	old; ancient
Antipathy	deep-seated hatred; extreme hostility and dislike
Apathy	lack of interest or concern; indifference
Aphorism	a short pithy instructive saying; an adage
Apocalyptic	prophetic of devastation or ultimate doom
Apogee	final climactic stage; the highest/farthest point
Appall	filled with apprehension or alarm; cause to be unpleasantly surprised
Appellation	a name, title or designation
Apposite	something of striking appropriateness and pertinence
Approbation	official recognition or approval
Arduous	difficult to accomplish; demanding considerable mental effort and skill
Arrogate	seize and take control without authority and possibly with force
Articulate	able to express oneself easily in clear and effective language
Artless	having or displaying no guile, cunning or deceit; innocent
Assiduous	perseverance in carrying out an action; diligent
Assuage	to satisfy or appease; to calm or to pacify
Attenuate	to make slender, fine or small; to lessen the density of; rarefy
Audacious	fearlessly, often recklessly, daring; bold
Austere	severe or stern in disposition or appearance; bare
Autonomous	independent in mind or judgment; self-directed
Avarice	immoderate desire for wealth; cupidity
Aver	to assert formally as a fact; to justify or prove

<b>B</b>	
Badger	annoy persistently
Baffle	frustrate; perplex
Bait	food or other lure used to catch fish or trap animals
Balk	hesitate; recoil
Balmy	mild and pleasant; soothing
Banal	repeated too often; familiar through overuse; boring
Bane	something causing misery or death
Baleful	deadly or sinister
Base	contemptible; morally bad; inferior in value or quality
Bask	derive or receive pleasure from; get enjoyment from
Bawl	cry loudly
Bedlam	a state of extreme confusion and disorder
Bedraggle	make wet and dirty, as from rain
Befuddle	confuse thoroughly
Begrudge	envy; give or allow unwillingly
Beguile	attract; cause to be enamoured
Behemoth	huge creature; something of monstrous size or power
Belittle	lessen the authority, dignity or reputation of; express a negative opinion
Bellicose	having or showing a ready disposition to fight
Belie	represent falsely
Belligerent	someone who fights or is aggressive
Bellow	shout loudly and without restraint
Bemused	confused; lost in thought; preoccupied
Benediction	the act of praying for divine protection
Benevolent	showing kindness; generous
Benign	kindly; favourable; not malignant
Bequeath	leave or give by will after one's death
Berate	censure severely or angrily
Besmirch	charge falsely; attack the good name and reputation of someone
Blandish	praise somewhat dishonestly
Blasphemy	the act of depriving something of its sacred character
Boisterous	noisy and lacking in restraint or discipline
Bombastic	ostentatiously lofty in style
Boorish	ill-mannered and coarse; contemptible in behaviour or appearance
Brackish	slightly salty
Braggart	a very boastful and talkative person
Brusque	abrupt and curt in manner or speech
Bucolic	descriptive of rural or pastoral life
Burgeon	grow and flourish
Buttress	a support, usually of stone or brick

## C

Cache	hiding place, a collection of similar items stored in a hidden or inaccessible place
Cacophony	a loud harsh or strident noise
Cajole	persuade by praise or false promise; coax; wheedle
Callous	hardened; without sympathy for the sufferings of others
Camaraderie	goodwill and light-hearted rapport between or among friends
Canard	unfounded false rumour; exaggerated false report
Candid	free from prejudice; impartial; frank
Capitulate	to surrender under specified conditions; come to terms
Capricious	characterised by or subject to whims; impulsive and unpredictable
Cardinal	of foremost importance; paramount
Caricature	a representation of a person that is exaggerated for comic effect
Carnage	the savage and excessive killing of many people
Castigation	punishment; chastisement; reproof
Cataclysm	an event resulting in great loss and misfortune; a great flood
Catholic	relating to the Church; comprehensive or universal
Cavalier	casual and offhand; arrogant
Cede	surrender formally
Celerity	speed; rapidity
Censure	harsh criticism or disapproval
Certitude	certainty
Charlatan	a person who makes fraudulent, and often voluble, claims to skill or knowledge
Chasm	a deep opening in the earth's surface; a difference of ideas, beliefs or opinions
Chagrin	strong feelings of embarrassment
Chicanery	deception by trickery or sophistry
Choleric	characterised by anger
Circumlocution	an indirect way of expressing something
Citadel	a stronghold into which people could go for shelter during a battle; fortress
Clairvoyant	a person who can look into the future
Coercion	using force to cause something to occur
Cogent	powerfully persuasive
Cognizant	marked by comprehension and perception: fully informed and aware
Collusion	secret agreement or conspiracy
Colossus	a person of exceptional importance and reputation
Comeliness	the quality of being good looking and attractive
Commensurate	corresponding in size, degree or extent; proportional
Commiserate	to feel or express sympathy or compassion
Compendium	a concise but comprehensive summary of a larger work
Complacent	contented to a fault; self-satisfied and unconcerned
Complaisant	showing a cheerful willingness to do favours for others
Concurrent	occurring or operating at the same time
Condone	excuse, overlook or make allowances for; be lenient with

## E

Ebb	recede; lessen; diminish
Ebullience	zestful enthusiasm
Eclectic	combining elements from a variety of sources
Ecstasy	rapture; very strong feeling of joy and happiness
Edifice	building (of imposing size)
Effeminate	having feminine traits or qualities; characterised by weakness and excessive refinement
Effervescence	enthusiasm; vivacity; the process of bubbling as gas escapes
Effete	exhausted, infertile or no longer effective; no longer possessing a unique quality
Efficacy	power or capacity to produce a desired effect; effectiveness
Effulgence	brilliant radiance; bright and sending out rays of light
Egregious	bad or offensive; strong and offensive in odour or flavour
Egress	a path or opening for going out; an exit
Elated	filled with excited joy and pride; overjoyed
Elegy	a poem or song composed especially as a lament for a deceased person
Elicit	to bring or draw out
Eloquent	persuasive, powerful discourse
Elucidate	explain; make clear; clarify; enlighten
Elusive	evasive; not frank; baffling; hard to grasp, catch or understand
Emaciation	extreme thinness and wasting, caused by disease or undernutrition
Emanate	issue forth; come out
Emancipate	action or process of setting free, especially from legal, social or political restrictions
Embroid	involve in dispute; complicate
Eminent	rising above others; high; lofty; distinguished
Emolument	salary; payment for an office; compensation
Emulate	imitate; rival; try to equal or excel
Encomium	warm, glowing praise
Endemic	prevalent in or peculiar to a particular locality, region or people
Endorse	approve; support
Enervate	to weaken or destroy the strength or vitality
Engender	to procreate; propagate; give rise to
Engross	occupy fully; absorb
Enigmatic	difficult to explain or understand
Enjoin	to give orders to
Ennui	the feeling of being bored by something tedious
Enthrall	hold spellbound
Entice	lure; persuade to do (something wrong); attract; tempt
Entrench	fix firmly or securely
Epiphany	a revelatory manifestation of a divine being
Equanimity	the quality of being calm and even-tempered; maintaining composure
Equivocal	deliberately ambiguous or vague

Decry	to condemn openly
Defection	withdrawing support or help despite allegiance
Deference	high degree of respect or courtesy
Defunct	no longer in use, force or operation
Delectable	greatly pleasing, normally associated with food; delicious
Deleterious	having a harmful effect; injurious
Deluge	a great flood or a heavy downpour
Demur	to voice opposition; object
Demure	shy
Denigrate	to defame or belittle
Depravity	moral corruption or degradation
Derelict	deserted by an owner or keeper; abandoned; run-down; dilapidated
Derision	the act of deriding or treating with contempt
Descry	to discover by careful observation or scrutiny; detect
Despondent	the condition of being depressed
Detrimental	causing damage or harm; injurious
Diatribe	a bitter, abusive denunciation
Dictum	an authoritative statement
Diffident	lacking self-confidence
Digress	turn aside, especially from the main subject of attention
Dilapidation	a state of deterioration due to old age or long use
Dilatory	wasting time
Dilemma	a confusing situation; a difficult choice
Dilettante	lacking the required professional skill
Dirge	a funeral hymn or lament
Disabuse	free somebody (from an erroneous belief)
Discern	detect with the senses
Disconsolate	sad beyond comforting; incapable of being consoled
Disgruntled	in a state of sulky dissatisfaction
Disparage	to speak of in a slighting or disrespectful way; belittle
Disquietude	feelings of anxiety that make you tense and irritable
Dissemble	to disguise or conceal behind a false appearance
Disseminate	to scatter widely, as in sowing seed
Dissidence	disagreement, especially with the government
Dissuade	discourage someone from a particular course of action
Divulge	reveal a secret
Dogmatic	orthodox; conventional
Dolorous	showing sorrow
Dregs	the sediment in a liquid; the basest or least desirable portion; residue
Droll	arousing laughter
Dulcet	pleasing to the ear

Congel	to thicken or to solidify
Connoisseur	an expert in some field, especially in the fine arts
Consecrate	render holy by means of religious rites
Consequential	having great significance, following as a result or effect
Contentious	argumentative; quarrelsome; controversial
Conundrum	a difficult problem; a puzzling situation
Convene	call together
Convivial	fun loving; fond of good company
Convolved	having numerous overlapping coils or folds
Copious	affording an abundant supply
Cornucopia	the property of being extremely abundant
Corporal	of or relating to the body
Corpulent	excessively fat
Covert	covered over; sheltered; secret
Cower	show submission or fear
Craven	an abject coward
Credulous	believe too readily; gullible
Crestfallen	brought low in spirit; dejected
Cryptic	secret; obscure in meaning
Culmination	a concluding action
Culpable	deserving blame or censure as being wrong or evil
Cursory	hasty and without attention to detail; not thorough
Cynicism	feeling of distrust

## D

Dabble	work in an amateurish manner
Dainty	delicate; delicately beautiful
Dandy	a man who is much concerned with his dress and appearance
Dapper	neat in appearance and quick in movements
Dauntless	having or showing courage
Dawdle	loiter; hang around; waste time doing nothing
Deadpan	impassive; with no show of feeling; with an expressionless face
Dearth	a scarce supply; a lack
Debacle	a complete failure
Debase	degrade; reduce in quality or value; degenerate
Debauchery	extreme indulgence in sensual pleasures; immoral self-indulgence
Debilitate	weaken (through heat, hunger, illness); enfeeble
Decadence	the state of being degenerate in mental or moral qualities
Decapitate	to cut off the head; behead
Decipher	decode
Decorum	appropriate behaviour; good manners
Decrepit	weak and in bad condition (from old age)

Erratic	lacking consistency, regularity or uniformity
Erudite	extremely learned
Eschew	to keep away from or to avoid
Esoteric	known by a restricted number of people; understood by few
Eulogy	high praise or commendation
Euphemism	substituting a mild, indirect or vague term for one considered harsh, blunt or offensive
Euphoria	a feeling of great happiness or well-being
Exacerbate	to increase the severity; to aggravate further
Exasperate	to provoke or annoy to an extreme degree
Exhume	to remove from a grave; to dig out of the earth something that has been buried
Exigent	requiring immediate action or remedy; demanding; exacting
Exodus	a departure of a large number of people
Exonerate	to free from blame
Expatriate	to give up residence in one's homeland; to send into exile
Expiate	to make amends; atone
Expurgate	remove parts considered harmful or improper for publication
Extirpate	to destroy totally; exterminate
Extol	to pay tribute or homage to; to honour
Exuberant	full of unrestrained enthusiasm or joy

## F

Fabrication	a deliberately false or improbable account
Facade	the face or front of a building or a showy misrepresentation intended to conceal something unpleasant
Facile	superficial; not deep
Factitious	not produced by natural forces
Fallacy	a misconception resulting from incorrect reasoning
Falter	hesitate; weaken in purpose or action; walk or move unsteadily with weakness
Farce	broad comedy; mockery; humorous play full of silly things happening
Fastidious	giving careful attention to detail; hard to please; excessively concerned with cleanliness
Fathom	comprehend
Fatuous	devoid of intelligence
Fawn	try to gain favour by cringing or flattering
Feign	pretend
Felicity	pleasing and appropriate manner or style; contentment; joy
Feral	not domestic; wild
Fervent	characterised by intense emotion; extremely hot
Fetid	having a foul smell
Fickle	changeable (in affections or friendship); faithless
Fidelity	the quality of being faithful
Finesse	delicate skill
Flabbergasted	as if struck dumb with astonishment and surprise



Flag	become less intense; lessen
Flagrant	conspicuously and outrageously bad or reprehensible
Fledgling	any new participant in some activity; young and inexperienced
Flout	treat with contemptuous disregard
Fluke	a stroke of luck
Flustered	thrown into a state of agitated confusion
Forage	the act of searching for food and provisions
Formidable	inspiring fear or extremely impressive in strength or excellence
Fortuitous	occurring by chance (positive) rather than intentional
Fractious	likely to be troublesome or easily irritated or annoyed
Fructify	make productive or fruitful
Frugality	prudence in avoiding waste
Frustrate	hinder or prevent (the efforts, plans or desires of)
Furtive	secretive; sly; done with caution and stealth
<b>G</b>	
Gainsay	to deny, dispute or contradict; to speak or act against
Gait	a person's manner of walking
Galvanize	to stimulate (someone) into taking action
Gambol	gay or light-hearted recreational activity for diversion or amusement
Gamut	entire range
Gape	open the mouth wide; stare wonderingly with the mouth open
Garbled	not orderly or coherent; lacking continuity
Gargantuan	of great mass; huge and bulky
Garish	overbright in colour; unpleasantly bright; gaudy
Garrulous	full of trivial conversation; talkative
Gauche	clumsy (in social behaviour); coarse and uncouth
Gaunt	lean and angular; thin and bony; emaciated
Germane	relevant and appropriate
Gesticulate	motion; gesture
Ghastly	shockingly repellent; inspiring horror
Gibe	mock; make jeering remarks
Giddy	dizzy; causing dizziness
Gingerly	very carefully
Gist	essence; main point; substance
Gloat	express evil satisfaction; look at or think about with evil satisfaction
Gluttonous	given to excess in consumption of especially food or drink
Grandiloquence	high-flown style; excessive use of verbal ornamentation
Gregarious	instinctively or temperamentally seeking and enjoying the company of others
Grouse	complain
Grovel	show submission or fear
Gullible	easily tricked because of being too trusting

## H

Hackneyed	repeated too often; overfamiliar through overuse
Hail	frozen rain
Hale	healthy
Hallowed	blessed; consecrated
Harangue	a loud bombastic declamation expressed with strong emotion
Harbinger	something that precedes and indicates the approach of something or someone
Harrowing	agonising; distressing; traumatic
Haughty	proud and arrogant
Headstrong	willful; stubborn; unyielding
Heckle	verbally harass, as with gibes
Heed	pay attention to
Herald	messenger; sign of something to come; announce; proclaim
Heterodox	characterised by departure from accepted beliefs or standards
Hiatus	an interruption in the intensity or amount of something
Hone	to sharpen; make perfect or complete
Hoodwink	conceal one's true motives by pretending to have good intentions so as to gain an end
Hubris	overbearing pride or presumption
Husband	use cautiously and frugally

## I

Iconoclast	someone who attacks cherished ideas or traditional institutions
Idiosyncrasy	a characteristic, habit, mannerism or the like that is peculiar to an individual
Ignominy	a state of dishonour
Illicit	illegal
Illusory	illusive; deceptive; not real
Imminent	close in time; about to occur
Immutable	unchanging
Impair	make worse or less effective or imperfect
Impassioned	filled with passion; fervent
Impassive	having or revealing little emotion or sensibility; not easily aroused or excited
Impeccable	faultless; perfect
Impecunious	not having enough money to pay for necessities
Impede	block or obstruct
Impending	nearing; approaching; about to happen
Impenitent	not penitent or remorseful
Imperious	having or showing arrogant superiority to and disdain of those one views as unworthy
Impertinence	the trait of being rude and inappropriate; inclined to take liberties
Impervious	not admitting of passage or capable of being affected
Impetuous	characterised by undue haste and lack of thought or deliberation
Impetus	incentive; stimulus; momentum
Impiety	without respect for God or religious values

Inplacable	incapable of being consoled/calmed
Implausible	highly imaginative but unlikely
Implicate	incriminate; involve incriminatingly; show to be involved (in a crime)
Implicit	understood but not stated; implied
Implore	ask or beg earnestly; beseech
Imponderable	difficult or impossible to evaluate with precision
Impoverish	make poor
Impuissance	powerlessness revealed by an inability to act
Impunity	exemption from punishment or loss
Inadvertent	happening by chance or unexpectedly or unintentionally
Inane	silly; senseless
Incapacitate	permanently injure or in any way made unable to perform an action
Incarcerate	imprison
Incessant	uninterrupted; unceasing
Incinerate	reduced to ashes
Incontrovertible	impossible to deny or disprove
Incorrigible	impossible to correct or reform
Incumbent	currently holding an office or a position of authority
Indiscreet	lacking good judgement; thoughtless
Indolent	disinclined to work or exertion; lazy
Inebriate	become drunk or drink excessively
Inexorable	not to be moved by persuasion; unyielding
Infallible	incapable of failure or error
Infringe	advance beyond the usual limit
Ingenious	showing inventiveness and skill
Ingenuous	inability to mask your feelings, lacking in sophistication or worldliness
Inherent	in the nature of something though not readily apparent
Inimical	not friendly
Innocuous	not injurious to physical or mental health; incapable of causing harm
Inordinate	beyond normal limits
Insidious	working or spreading in a hidden and usually injurious way
Insipid	lacking interest or significance or impact; without flavour or taste
Insular	narrowly restricted in outlook or scope; suggestive of the isolated life of an island
Intangible	incapable of being perceived by the senses, especially the sense of touch
Interment	the ritual placing of a corpse in a grave
Interminable	tiresomely long; seemingly without end
Intractable	difficult to manage or mould or change
Intransigent	impervious to pleas, persuasion, requests or reason
Intrepid	without fear or cannot be intimidated
Intuition	a keen and quick insight; the ability to perceive the truth in something
Inundate	fill or cover completely or beyond normal capacity
Inured	made tough and immune by habitual exposure

Invective	abusive or venomous language used to express blame or bitter deep-seated ill will
Irascible	quickly aroused to anger
Irrepressible	impossible to control or suppress
Irresolute	uncertain how to act or proceed
Itinerary	a proposed route of travel

## J

Jabber	chatter rapidly or unintelligibly
Jargon	a characteristic language of a particular group
Jeer	showing your contempt by derision
Jeopardise	pose a threat to; present a danger to
Jest	activity characterised by good humour
Jibe	an insulting remark to someone
Jocose/Jocular	given to (having a tendency of) joking
Jubilant	joyful and proud, especially because of triumph or success
Juxtapose	place side by side

## K

Kernel	central or vital part; core
Kindle	call forth (emotions, feelings and responses) or cause to start burning
Kinship	a close connection marked by community of interests or similarity in nature or character
Kleptomaniac	someone with an irrational urge to steal in the absence of an economic motive
Knack	special talent
Knave	a deceitful and unreliable scoundrel
Knell	tolling of a bell, especially to indicate a funeral, disaster and so on
Knoll	little round hill; hillock
Knotty	intricate; difficult; tangled
Kudos	an expression of approval and commendation

## L

Labyrinth	complex system of paths or tunnels in which it is easy to get lost
Lachrymose	showing sorrow
Lackadaisical	idle or indolent, especially in a dreamy way; lacking spirit or liveliness
Lacklustre	lacking lustre (shine, gloss); dull
Laconic	brief and to the point
Laggard	someone who lags behind
Lament	grieve; express sorrow
Languid	lacking spirit or liveliness
Languish	lose vigour, health or flesh, as through grief; become feeble
Largess	liberality in bestowing gifts; extremely liberal and generous of spirit
Lassitude	weariness; listlessness
Laud	praise, glorify or honour

Lax	careless; negligent; not paying enough attention
Lethargic	deficient in alertness or activity
Levity	a manner lacking seriousness
Libertine	a dissolute person; usually a man who is morally unrestrained
Limpid	crystal clear
Linger	be slow in leaving; delay going
Linguistic	consisting of or related to language
Lionise	treat (a person) as a celebrity
Lissome	moving and bending with ease
Listless	lacking in spirit or energy; languid
Livid	extremely angry
Loath	reluctant; unwilling; disinclined
Loathe	find repugnant
Loquacious	full of trivial conversation
Loutish	ill-mannered and coarse and contemptible in behaviour or appearance
Lucid	transparently clear; easily understandable, transmitting light; able to be seen through with clarity
Lucrative	producing a sizeable profit
Lugubrious	excessively mournful
Luminous	softly bright or radiant
Lurid	glaringly vivid and graphic; marked by sensationalism

## M

Magnanimity	liberality in bestowing gifts; extremely liberal and generous of spirit
Maim	mutilate; injure lastingly; disable
Maladroit	not skillful
Malady	illness
Malapropism	the unintentional misuse of a word by confusion with one that sounds similar
Malediction	the act of calling down a curse that invokes evil (and usually serves as an insult)
Malevolent	having or exerting a malignant influence
Malfeasance	wrongful conduct by a public official
Malingering	to pretend illness, especially in order to shirk one's duty, avoid work and so on
Malleable	adaptable; tractable; yielding
Malodorous	having an unpleasant smell
Manifest	evident; visible; obvious
Manipulate	control or play upon (people, forces, etc.) artfully; maneuver
Mar	spoil the appearance of
Martyr	one who suffers for the sake of principle
Masquerade	wear a mask or disguise; pretend
Masticate	chew (food); to bite and grind with the teeth
Maul	handle roughly; batter; injure by beating
Maverick	someone who exhibits great independence in thought and action

Maxim	proverb; truth pithily stated
Mayhem	violent disorder
Meagre	scanty; inadequate
Meander	wind or turn in its course; follow a winding or turning course; move aimlessly and idly
Meddlesome	intrusive; interfering
Medley	mixture
Meek	submissive; patient and long-suffering
Melancholy	gloomy; morose
Melee	a noisy riotous fight
Mellifluous	sounds that are pleasing to the ear
Menace	something that is a source of danger
Mendacity	the tendency to be untruthful
Mendicant	a pauper who lives by begging
Mesmerise	hypnotise
Metamorphosis	change of form
Meticulous	marked by extreme care in treatment of details
Mettle	the courage to carry on
Misanthrope	someone who dislikes people in general
Misconstrue	interpret in the wrong way
Misdemeanor	misbehaviour; misdeed; a crime less serious than a felony
Misnomer	an incorrect or unsuitable name
Misogynist	a misanthrope who dislikes women in particular
Mitigate	make less severe or harsh
Mollify	make less rigid or softer; make more temperate, acceptable or suitable
Mollycoddle	treat with excessive indulgence
Morose	showing a brooding ill humour
Mundane	not ideal or heavenly; found in the ordinary course of events
Munificent	very generous
Myopic	unable to see distant objects clearly; lacking foresight or scope

## N

Naive	marked by or showing unaffected simplicity and lack of guile or worldly experience
Nascent	being born or beginning
Natty	marked by up-to-dateness in dress and manners
Nausea	feeling of sickness and desire to vomit
Nebulous	lacking definition or definite content
Necromancy	conjuring up the dead, especially for prophesying
Nefarious	extremely wicked
Nemesis	something that brings an end to something; causing misery or death
Neophyte	any new participant in some activity
Nepotism	favouritism (to a relative)
Nettle	cause annoyance in; disturb

Nimble	quick in movement; agile; quick in understanding
Noisome	foul smelling; causing or able to cause nausea
Nonchalant	marked by complete lack of concern
Nonplussed	filled with bewilderment
Nostalgia	longing for the past
Notoriety	disrepute; ill fame
Notoriety	the state of being known for some unfavourable act or quality
Novice	someone new to a field or activity
Noxious	injurious to physical or mental health
Nuance	a subtle difference in meaning or opinion or attitude
Nugatory	of no real value
Numismatics	the collection and study of money (and coins in particular)

## O

Obdurate	stubborn; resistant
Obeisance	the act of obeying; dutiful or submissive behaviour
Obese	excessively fat
Obfuscate	make obscure or unclear
Objurgating	to reproach or denounce vehemently; upbraid harshly; berate sharply
Obliterate	destroy completely; wipe out
Oblivious	inattentive or unmindful; unaware; wholly absorbed
Obnoxious	causes disapproval or harm to something
Obscure	dark; vague; unclear; not well known
Obsequious	attentive in an ingratiating or servile manner
Obsolete	outmoded; no longer used
Obstinate	persist stubbornly
Obstreperous	boisterously and noisily aggressive or defiant
Obtuse	slow to learn or understand; lacking intellect
Obviate	prevent the occurrence of; prevent from happening
Occlude	block passage through
Odious	sincerely hated and despised
Olfactory	concerning the sense of smell
Ominous	threatening; of an evil omen
Omnipotent	having unlimited power
Omnipresent	universally present; ubiquitous
Onerous	burdensome, tiring, heavy load that makes one weary
Onus	an onerous or difficult concern
Opprobrium	a state of extreme dishonour and disgrace
Opulence	wealth as exhibited by sumptuous living
Ordain	order by virtue of superior authority; decree
Ordeal	severe trial or affliction; difficult experience
Orthodox	traditional; (of someone) conservative in belief; adhering to an established doctrine

Ossified	set in a rigidly conventional pattern of behaviour, habits or beliefs
Ostentatious	intended to attract notice and impress others
Ostracise	avoid speaking to or dealing with; expel
Overbearing	having or showing arrogant superiority to and disdain of those one views as unworthy
Overt	open and observable; not secret or hidden

## P

Pacify	soothe; make calm or quiet; subdue
Paeon	a formal expression of praise
Painstaking	taking pains; showing hard work; taking great care
Palatable	agreeable; pleasing to the taste
Palate	roof of the mouth
Palette	board on which painter mixes pigments
Palindrome	a word or phrase that reads the same backward as forward
Pallid	pale; wan
Palpable	easily perceptible; obvious
Paltry	meagre
Pan	criticise harshly
Panacea	hypothetical remedy for all ills or diseases
Panache	flair; flamboyance
Pandemic	widespread; affecting the majority of people
Pandemonium	wild noisy disorder
Panegyric	a formal expression of praise
Paradox	a statement that contradicts itself
Paragon	a perfect embodiment of a concept
Paramount	foremost in importance; supreme
Paraphernalia	equipment; odds and ends used in a particular activity
Paraphrase	restatement of text in one's own words
Parched	extremely dry; very thirsty
Pare	cut away the outer covering or skin of (with a knife); trim
Parochial	narrowly restricted in outlook or scope
Parry	dodge; circumvent
Parsimonious	excessively unwilling to spend
Partisan	one sided; prejudiced
Passive	inactive
Patent	obvious; easily seen; open for the public to read
Pathogenic	able to cause disease
Pathos	tender sorrow; pity
Patronise	be a regular customer or client of
Paucity	scarcity; dearth
Pauper	very poor person
Peccadillo	slight offense or fault



Pecuniary	pertaining to money
Pedagogue	someone who educates young people
Pedant	a person who pays more attention to formal rules and book learning than they merit
Pedestrian	lacking wit or imagination
Pejorative	having a disparaging, derogatory or belittling effect or force
Pellucid	transparently clear; easily understandable
Penitent	feeling or expressing remorse for misdeeds
Penurious	excessively unwilling to spend
Peremptory	not allowing contradiction or refusal
Perennial	recurring again and again
Perfidy	an act of deliberate betrayal
Perfunctory	hasty and without attention to detail; as a formality only
Pernicious	working or spreading in a hidden and usually injurious way
Peroration	the concluding section of an oration
Perspicacious	having keen mental perception and understanding; acutely insightful and wise
Peruse	examine or consider with attention and in detail
Pervasive	spreading or spread throughout
Philanthropy	donations to charity
Phlegmatic	showing little emotion
Pillage	the act of stealing valuable things from a place
Pillory	to expose to public derision, ridicule or abuse
Pine	have a desire for something or someone
Pique	to arouse an emotion or provoke to action
Pith	the choicest or most essential or most vital part of some idea or experience
Pithy	concise and full of meaning
Pittance	an inadequate payment
Placate	to appease or pacify, especially by concessions or conciliatory gestures
Plagiarise	take without referencing from someone else's writing or speech
Plebiscite	a vote by the electorate determining public opinion on a question of national importance
Plethora	extreme or excess
Pluck	courage or resolution in the face of difficulties
Plumb	examine thoroughly and in great depth; exactly
Plummet	drop sharply
Polemic	a controversial argument, as one against some opinion, doctrine and so on
Potion	a medicinal or magical or poisonous beverage
Pragmatic	concerned with practical matters
Prattle	idle or foolish and irrelevant talk
Precursor	something that precedes and indicates the approach of something or someone
Predilection	a predisposition in favour of something
Preen	to be exultant or proud
Preponderant	having superior power and influence

Prescience	the power to foresee the future
Presumptuous	unwarrantedly or impertinently bold
Prevaricate	be deliberately ambiguous or unclear in order to mislead or withhold information
Pristine	immaculately clean and unused
Privation	a state of extreme poverty
Probity	having strong moral principles
Proclivity	a natural inclination
Prodigal	wastefully or recklessly extravagant
Prodigious	so great in size or force or extent as to elicit awe
Profligate	shameless; dissolute; extravagant
Profound	showing intellectual penetration or emotional depth; pervasive or intense; thorough
Profuse	produced or growing in extreme abundance
Proletariat	a social class comprising those who do manual labour or work for wages
Proliferate	cause to grow or increase rapidly
Prolific	productive
Prolix	tediously prolonged or tending to speak or write at great length
Promulgate	put a law into effect by formal declaration; promote an idea or cause
Propound	put forward, as of an idea
Propriety	correct or appropriate behaviour
Prosaic	lacking wit or imagination
Proscribe	command against; prohibit
Proselytise	convert to another faith or religion
Prudence	discretion in practical affairs
Puerile	displaying or suggesting a lack of maturity
Pugilist	someone who fights with his fists for sport
Punctilious	marked by precise accordance with details
Pungent	strong and sharp
Pusillanimous	lacking in courage and manly strength
Putrefy	become putrid; decay with an offensive smell

## Q

Quack	medically unqualified
Quaff	to swallow hurriedly or greedily
Quagmire	a soft wet area of low-lying land that sinks underfoot
Qualms	a sudden feeling of apprehensive uneasiness
Quandary	state of uncertainty or perplexity, especially as requiring a choice between equally unfavourable options
Quarantine	isolation to prevent the spread of infectious disease
Quarry	animal hunted or caught for food
Quash	put down by force or intimidation
Queasy	causing or fraught with or showing anxiety
Quench	suppress or crush completely; satisfy one's thirst

Querulous	habitually complaining
Quibble	argue over petty things
Quiddity	the quality that makes a thing what it is
Quiescent	being at rest; quiet; still; inactive or motionless
Quirk	a strange attitude or habit
Quisling	a person who betrays his or her own country by aiding an invading enemy
Quiver	a shaky motion
Quixotic	not sensible about practical matters; idealistic and unrealistic
Quorum	a gathering of the minimal number of members of an organisation to conduct business
Quotidian	found in the ordinary course of events; usual or customary

## R

Rabble	mob; noisy crowd
Rabid	marked by excessive enthusiasm for and intense devotion to a cause or idea
Racketeer	a person who has dishonest and fraudulent dealings
Raconteur	a person skilled in telling anecdotes
Raffish	marked by a carefree unconventionality or disreputableness
Raffle	lottery
Rail	criticise severely
Rake	immoral or dissolute person
Rally	come or bring together; call up or summon
Ramification	one of the results following from an action or decision
Rampant	growing or spreading uncontrollably; growing in profusion
Ramshackle	in deplorable condition
Rancid	smelling of fermentation or staleness
Rancorous	showing deep-seated resentment
Rank	offensive in odour or flavour
Rankle	irritate; fester; annoy
Ransack	search thoroughly; pillage
Rant	speak violently or excitedly; rave
Rapacious	devouring or craving food in great quantities
Rapport	close relationship; emotional closeness; harmony
Rapt	engrossed; absorbed; enchanted
Rapture	great joy and delight; ecstasy
Rarefy	make more subtle or refined; become thin
Rave	an extravagantly enthusiastic review
Recalcitrant	marked by stubborn resistance to authority
Recant	to reject or disavow a formerly held belief or opinion
Recondite	difficult to penetrate; incomprehensible to one of ordinary understanding or knowledge
Recuperate	get over an illness or shock
Redoubtable	worthy of respect or honour
Referendum	a legislative act is referred for final approval to a popular vote by the electorate

Relegate	assign to a lower position; reduce in rank
Remiss	failing in what duty requires
Remonstrate	censure severely or angrily
Renascence	a second or new birth
Rendezvous	a meeting planned at a certain time and place
Renegé	fail to fulfill a promise or obligation
Repertoire	the entire range of skills or aptitudes or devices used in a particular field or occupation
Reprehensible	bringing or deserving severe rebuke or censure
Reprisal	a retaliatory action against an enemy in wartime
Repudiate	eject as untrue, unfounded or unjust
Requiem	a song or hymn of mourning composed or performed as a memorial to a dead person
Rescind	cancel officially
Resilience	an occurrence of rebounding or springing back
Restive	being in a tense state
Reticence	hesitation; shyness
Reverent	feeling or showing profound respect or veneration
Rhetoric	study of the technique and rules for using language effectively
Ribald	someone who uses vulgar and offensive language
Risqué	suggestive of sexual impropriety
Robust	sturdy and strong in form, constitution or construction
Rupture	burst

## S

Sacerdotal	associated with the priesthood or priests
Sacrilege	blasphemous behaviour
Sacrosanct	must be kept sacred
Sagacious	acutely insightful and wise
Salubrious	promoting health; healthful
Salutary	synonym of salubrious
Salvage	rescue (goods or property) from loss
Sanctimonious	excessively or hypocritically pious
Sanction	the act of final authorisation; restrictions or limitations
Sanguinary	marked by eagerness to resort to violence and bloodshed
Sanguine	a blood red colour; confidently optimistic and cheerful
Sap	deplete
Sapid	full of flavour
Sardonic	disdainfully or ironically humorous; scornful and mocking
Satiate	fill to satisfaction
Satire	witty language used to convey insults or scorn
Saturnine	sluggish in temperament; gloomy; taciturn
Saunter	a leisurely walk
Savour	enjoy; have a distinctive flavour, smell or quality

Scale	climb up; ascend
Scanty	meagre
Scapegoat	someone who is punished for the errors of others
Schism	division of a group into opposing factions
Scintillate	sparkle; flash; be animated; be full of life
Scion	a descendent or heir
Scoff	laugh (at); mock; ridicule
Scorch	a discolouration caused by heat, sear, burn
Scowl	frown angrily
Scrupulous	arising from a sense of right and wrong; principled
Scrutinise	examine closely and critically
Scurrilous	grossly or obscenely abusive
Seasoned	experienced
Secede	withdraw from an organisation or communion
Seclusion	isolation; solitude
Sedate	cause to be calm or quiet as by administering a sedative to
Sedentary	requiring sitting or little activity
Sedition	incitement of discontent or rebellion against a government
Sedulous	marked by care and persistent effort
Seedy	rundown; decrepit; disreputable
Seminal	very important; containing seeds of later development
Senescent	growing old
Sententious	given to excessive moralising
Sepulcher	a chamber that is used as a grave
Serendipity	good luck in making unexpected and fortunate discoveries
Servitude	state of subjection to an owner or master or forced labour imposed as punishment
Sever	cut off from a whole
Shard	a broken piece of a brittle artefact
Silhouette	a drawing of the outline of an object
Simper	to smile in a silly, self-conscious way
Simulate	create a representation or model of
Sinewy	consisting of tendons or resembling a tendon; possessing physical strength and weight; rugged and powerful
Sinister	threatening or foreshadowing evil or tragic developments
Skirmish	a minor short-term fight
Sloth	a disinclination to work or exert yourself
Solicitous	anxious or concerned; eager
Somatic	affecting or characteristic of the body as opposed to the mind or spirit
Sophistry	a false or deceptive argument
Sophomore	a second year undergraduate
Soporific	sleep inducing
Sordid	meanly selfish; dirty; filthy

Specious	plausible but false
Spendthrift	someone who spends money prodigally
Sporadic	recurring in scattered and irregular or unpredictable intervals
Spurious	intended to deceive; fake
Squander	spend extravagantly; waste
Static	showing little if any change; angry criticism
Steep	let sit in a liquid to extract a flavour or to cleanse
Stentorian	very loud or powerful in sound
Stickler	someone who insists on something
Stoic	someone who is seemingly indifferent to emotions
Stolid	having or revealing little emotion or sensibility; not easily aroused or excited
Strut	a proud stiff pompous gait
Stultify	deprive of strength or efficiency; make useless or worthless
Stupefy	make senseless or dizzy by or as if by a blow
Stymie	hinder or prevent the progress
Sublime	lofty or grand
Succinct	expressed in few words; concise
Succulent	full of juice
Suffuse	cause to spread or flush or flood through
Sully	to soil, stain or tarnish
Supercilious	expressive of contempt
Superfluous	more than is needed, desired or required
Supplant	take the place or move into the position of
Supplicate	ask humbly (for something)
Surreptitious	conducted with or marked by hidden aims or methods
Swelter	suffer from intense heat
Sycophant	a person who tries to please someone in order to gain a personal advantage
<b>T</b>	
Tacit	implied by or inferred from actions or statements
Taciturn	habitually reserved and uncommunicative
Tawdry	cheap and shoddy
Tedium	dullness owing to length or slowness
Teetotaler	one who abstains from drinking
Temerity	fearless daring
Tempestuous	characterised by violent emotions or behaviour
Tenacity	persistent determination
Tendentious	having or showing a definite tendency, bias or purpose
Tenet	a religious doctrine that is proclaimed as true without proof
Tenuous	lacking substance or significance; thin or slender in form
Tepid	moderately warm; feeling or showing little interest or enthusiasm
Terse	brief and to the point

Tether	tie with a tether
Thrall	the state of being under the control of another person
Throes	violent pangs of suffering
Thwart	hinder or prevent
Timorous	timid by nature or revealing timidity
Tirade	a speech of violent denunciation
Titan	a person of exceptional importance and reputation
Toady	a person who tries to please someone in order to gain a personal advantage
Topography	precise detailed study of the surface features of a region
Torpid	slow and apathetic
Torpor	inactivity resulting from lethargy and lack of vigour or energy
Torque	a twisting force
Tortuous	not straightforward
Tousled	in disarray; extremely disorderly
Tractable	easily managed or controlled
Traduce	speak unfavourably about
Transgression	the action of going beyond or overstepping some boundary or limit
Transient	one who stays for only a short time
Translucent	allowing light to pass through diffusely
Transmute	change in outward structure or looks
Travesty	any grotesque or debased likeness or imitation
Trenchant	incisive or keen; vigorous; clear-cut
Truculent	defiantly aggressive
Truism	an obvious truth
Truncate	make shorter as if by cutting off
Tryst	a secret rendezvous; a date
Turnefy	expand abnormally
Turbid	cloudy; murky
Turpitude	a corrupt or depraved or degenerate act or practice
Tutelage	teaching pupils individually
Tyro	someone new to a field or activity

## U

Ubiquitous	being present everywhere at once
Ultior	being beyond what is seen or avowed; intentionally kept concealed
Umbrage	a feeling of anger caused by being offended
Unabashed	not embarrassed
Unconscionable	lacking a conscience
Unctuous	characterised by excessive piousness or moralistic fervour
Undermine	to attack by indirect, secret or underhand means
Underscore	give extra weight to
Undulate	move in a wavy pattern or with a rising and falling motion

Unfathomable	impossible to understand
Unfeigned	not pretended; sincerely felt or expressed
Unflagging	unceasing
Unfledged	young and inexperienced
Unfrock	to deprive (a monk, priest, minister, etc.) of ecclesiastical rank, authority and function
Ungainly	lacking grace in movement or posture
Unimpeachable	free of guilt; not subject to blame
Unkempt	not properly maintained or cared for
Unprecedented	having no precedent
Unremitting	not slackening or abating; incessant
Unsavoury	morally offensive
Unseemly	not in keeping with accepted standards of what is right or proper in polite society
Unstinting	very generous
Unsullied	free from blemishes
Untenable	incapable of being defended or justified
Untoward	contrary to your interests or welfare
Unwieldy	difficult to use or handle or manage because of size or weight or shape
Unwitting	not aware or knowing
Upbraid	express criticism towards
Upshot	the final issue, the conclusion or the result
Urbane	sophisticated; polished; refined in manner
Usurp	seize and take control without authority and possibly with force
Usury	the act of lending money at an exorbitant rate of interest
Utilitarian	having a useful function
Utopia	an imaginary place considered to be perfect or ideal

## V

Vacillate	be undecided about something
Vacuous	devoid of matter
Vagary	an unpredictable or erratic action, occurrence, course or instance
Vainglorious	feeling self-important
Valediction	the act of saying farewell
Vanguard	the leading position in any movement or field
Vantage	the quality of having a superior or more favourable position
Vapid	lacking significance, liveliness, spirit or taste
Variegated	having a variety of colours
Venal	capable of being corrupted
Vendetta	any prolonged and bitter feud or rivalry
Venerate	regard with feelings of respect and reverence
Veracity	conformity to truth or fact; accuracy
Verbatim	using exactly the same words
Verbose	using or containing too many words



Verisimilitude	the appearance of truth; the quality of seeming to be true
Vertiginous	having or causing a whirling sensation, liable to falling
Vestige	an indication that something has been present; trace of something that is disappearing
Vex	to irritate; annoy; provoke
Viable	capable of being done
Vicarious	suffered or done by one person as a substitute for another
Vicissitude	a change or variation occurring in the course of something
Vic	compete for something
Vigilant	carefully observant or attentive
Vignette	a brief literary description
Vilify	spread negative information about
Virtuoso	having or revealing supreme mastery or skill
Virulent	infectious; having the ability to cause disease
Viscous	thick
Vitreous	relating to or resembling or derived from or containing glass
Vitriol	abusive or venomous language
Vituperative	marked by harshly abusive criticism
Vociferous	conspicuously and offensively loud
Volition	the act of making a choice
Voluble	marked by a ready flow of speech
Voluminous	large in number or quantity
Voracious	devouring or craving food in great quantities
Vulnerable	exposed to the possibility of being wounded or hurt

## W

Waft	be driven or carried along, as by the air
Wag	move from side to side
Waive	forego; dispense with
Wallow	an indolent or clumsy rolling about; delight greatly in
Wanderlust	very strong or irresistible impulse to travel
Wane	a gradual decline (in size, strength, power or number)
Wastrel	someone who dissipates resources self-indulgently
Waver	the act of moving back and forth
Welter	be immersed in; a confused multitude of things
Wheddle	influence or urge by gentle urging, caressing or flattering
Whet	make keen or more acute; stimulate
Whimsical	determined by chance or impulse or whim rather than by necessity or reason
Whittle	cut small bits or pare shavings from
Wilful	done by design; intentional
Wily	marked by skill in deception
Winnow	blow away or off with a current of air
Winsome	charming in a childlike or naive way

Wizened	lean and wrinkled by shrinkage as from age or illness
Wont	an established custom
Wraith	a visible spirit
Wreck	a serious accident; smash or break forcefully
Writ	a legal document issued by a court or judicial officer
Wry	humorously sarcastic or mocking

## X

Xenophobia	a fear of foreigners or strangers
Xenophylic	an attraction to foreign peoples, cultures or customs
Xerothermic	characterised by heat and dryness
Xylophone	a musical instrument

## Y

Yearn	have a desire for something
Yeoman	farmer who owns and works his land
Yield	bear, produce or provide
Yoke	a connection, usually between cows on a farm
Yokel	simple-minded country person; bumpkin
Yore	time long past

## Z

Zany	ludicrous; foolish
Zealot	a fervent and even militant proponent of something
Zenith	highest point; apex
Zephyr	a slight wind
Zest	great enjoyment or excitement; gusto
Zoology	study of animals

2.4

## 4.5 Grammar

## 4.6 What is Measured?

The grammar section will test your ability to apply common grammar rules such as agreement of the subject with the verb and with the pronoun, tenses, modifiers, etc. *no*

You will also be tested on the correct usage of idiomatic expressions such as *forbid to* (and not *from*), *between.....and* (not *or*), etc.

Your ability to understand the meaning of sentences will also be tested as you will need to identify the option that conveys the correct meaning, using the least number of words.

## 4.7 Overall Test Taking Strategies

- Read the entire sentence carefully and make sure you have understood its meaning.
- Avoid using the ear (or what *sounds* correct) to answer questions. Try to apply the grammar rules instead.
- Always narrow down to two choices and read both the choices back into the original sentence before selecting your final answer.

The next few sections will provide you with in-depth strategies for approaching each topic.

# 1 Parts of Speech

Before taking a look at the specific errors that will be tested on NMAT by GMAC™ grammar questions, it is important to brush up on your basic grammar fundamentals. So let's take a look at the different parts of speech as these are the building blocks of all sentences. There are eight parts of speech in the English language:

1. Noun
2. Pronoun
3. Adjective
4. Verb
5. Adverb
6. Preposition
7. Conjunction
8. Interjection

## 1. Noun

**Nouns** are naming words. Everything we see or talk about is represented by a word which names it—that word is called a *noun*. Nouns can be names for people, animals, places, objects, substances, qualities, actions, etc.

- Names for people, animals, places—Tom, Englishman, brother, cat, office, China
- Names for objects and substances—chair, computer, hammer, oxygen, water, ice
- Names for qualities—kindness, beauty, bravery, faith

## 2. Pronoun

A **pronoun** is a word that is typically used to replace a noun or another pronoun in a sentence. You use pronouns such as *he*, *she*, *them*, *their*, *which*, *that*, etc. to make your sentence less cumbersome and less verbose.

For example,

*Do you like the CEO? I don't like the CEO. I think the CEO is too arrogant.*

The above lines sound wordy and repetitive. Using pronouns, we can reframe the above lines as:

*Do you like the CEO? I don't like him. I think he is too arrogant.*

The first sentence sounds awkward while the second sentence replaces the second noun *CEO* with the pronouns *him* and *he* and gets the meaning across more crisply.

## 3. Adjective

An **adjective** modifies or describes a noun or a pronoun by describing, identifying or quantifying words. An adjective usually precedes the noun or the pronoun that it modifies.

In the following examples, the **highlighted** words are adjectives:

- *The red balloon floated over the mountains.*
- *Mrs. Jones painted her kitchen walls in a hideous colour.*
- *The little dog fought bravely with the large buffalo.*

#### 4. Verb

The verb is perhaps the most important part of a sentence. Even the shortest sentence contains a verb. You can make a one-word sentence with a verb, for example:

*'Run.'*

You cannot make a one-word sentence with any other type of word.

Verbs are sometimes described as *action words*. This is partly correct because many verbs give the idea of action, of *doing* something. For example, words such as *speak, write, do, work*, all convey action.

However, there are some verbs that do not give the idea of action; they give the idea of existence or of a state of being. For example, verbs such as *be, exist, seem* and *belong*, all convey state.

Thus, verbs are words that tell us what a subject does or is, that is, they describe:

- *action (Jack plays football), or*
- *state (Jack seems angry)*

#### 5. Adverb

An adverb can modify or describe a verb, an adjective, another adverb, a phrase or a clause. An adverb indicates *manner, time, place, cause* or *degree* and answers questions such as *how, when, where, how much*, etc.

- *The tailor quickly stitched the suit.* [In this sentence, the adverb *quickly* modifies the verb *stitched* and indicates in what manner (or how fast) the suit was stitched].
- *The students sat patiently through the long lecture.* (In this sentence, the adverb *patiently* modifies the verb *sat*).

#### 6. Preposition

A preposition is a word that links nouns, pronouns and phrases to other words in a sentence. A preposition always goes with a noun or pronoun that is called the object of the preposition. Some common prepositions include *in, of, about, above, below, beneath, by, despite, down* and *during*.

Examples:

- *The cup is on the desk.*
- *The cup is under the desk.*
- *The cup is beside the desk.*
- *He held the cup over the desk.*
- *He drank from the cup during class.*

In each of the preceding sentences, a preposition locates the noun *cup* in space or in time.

#### 7. Conjunction

Conjunctions are connecting words that are used to link words, phrases and clauses. They include words such as *and, but, or, nor, for, so, yet*, etc.

Examples:

- *I ate the burger and the sandwich.*
- *Call the applicants when you are ready.*

## 8. Interjection

Hello!

That's an interjection.

Interjections are short exclamations such as *Oh!*, *Ah!*, etc. They have no real grammatical value but we use them quite often, usually more in speaking than in writing. An interjection is sometimes followed by an exclamation mark (!) when written.

Examples:

- *Ah!*
- *Alas!*
- *Hmm*

## 2 Identify the Error

The Identify the Error questions on the NMAT by GMAC™ will test your knowledge of English grammar and usage. In this question type, you will be given a sentence, four parts of which (labelled from A to D) will be underlined. You will need to identify the one underlined word or phrase that must be changed in order to make the sentence correct. Mark E for no error.

Let us take a look at an example.

Most followers of tennis regard Roger Federer to be the best tennis player on the planet.

- (A) followers of tennis
- (B) to be
- (C) best tennis player
- (D) on the planet
- (E) No error

The correct idiomatic construction with *regard* is *as* and not *to be*. Hence the error is in part B, that is, option (B) is the correct answer to the question.

Following are the most common error types tested in the NMAT by GMAC™ Identify the Error questions:

1. Usage of the correct pronoun
2. Agreement of the pronoun and verb with the noun
3. Incorrectly used words
4. Incorrectly used idiomatic expressions
5. Incorrectly used modifiers
6. Parallel structure
7. Redundancy
8. Usage of the correct tense of the verb
10. Usage of the correct adjective

### Usage of the correct pronoun

1. I/we/you/he/she/it/they are pronouns that represent the subject in a sentence, while me/us/you/him/her/it/them are pronouns that represent the object.
  - I gave the packet to him.
  - She gave a rose to me.
  - We are faster than they are fast, gets shortened to:
    - We are faster than they.
    - We are faster than them. (Incorrect)
2. An instance where both 'they' and 'them' are correctly used:
  - I like the Taj Mahal more than they. (I like the Taj Mahal more than they like it.)
  - I like the Taj Mahal more than them. (I like the Taj Mahal more than I like them.)
3. Usage of who, which and that:
  - 'Who' refers to people and 'which' and 'that' typically refer to things or groups.



- Saina is the sportsperson who has made India proud. (*who* refers to Saina.)
- The fifth match, which was played at Delhi, got her the number one rank. (*which* refers to match.)

4. 'That' is distinguished from 'which' in its use to introduce an essential clause:

- The products that were old were taken off the shelf.

The above sentence implies that there were products other than the old ones (additional information or essential clause) and that only the old ones were taken off the shelf.

- The products, which were old, were taken off the shelf.

The thing with 'which' is that, since it is a non-essential modifier, you can remove the part with *which* from the sentence and the sentence will still make sense. Thus, the above sentence implies that all the products were taken off the shelf, and it also gives you the additional information (in the part with *which*) that all the products were old.

5. Usage of *who* and *whom*:

If the pronoun is to be used for the subject, use 'who' and if the pronoun is used for the object, use 'whom'.

- Who is going to the party? ('who' is going to the party?)
- Whom are you taking to the party? ('you' are taking 'whom' to the party?)
- We all know who/whom started the trouble.

This sentence has two clauses: 'we all know' and 'who started the trouble'. Hence, 'who' rather than 'whom' is correct.

6. Usage of *each other* and *one another*:

*Each other* refers to two items, while *one another* refers to more than two items.

- At the campus, I came across my colleague and we complimented each other.
- The guests at the party knew one another. (This sentence implies that each guest knew the rest.)
- The scientists at the conference were exchanging ideas with each other. (This sentence implies that the exchange was happening between two scientists at a time)



**Important Learning:** Whenever you come across a pronoun in the underlined part of a sentence, immediately check if it is in the correct case.

## Agreement of the pronoun and verb with the noun

### 1. Pronoun agreement

A pronoun must agree with the noun it represents in terms of person, number and gender.

- When people travel, we must be careful. (Incorrect)
- When people travel, they must be careful. (Correct)
- When one travels, he must be careful. (Incorrect)
- When one travels, one must be careful. (Correct)

## 2. Verb agreement

The verb must agree with the noun it complements.

- The list of items **were** long. (Incorrect)
- The list of items **was** long. (Correct—The list was long. Not the items.)
- The number of residents in the colony **are** growing. (Incorrect)
- The **number** of residents in the colony **is** growing. (Correct—The number is growing and not the residents.)
- A large number of residents **is** coming. (Incorrect)
- A large number of **residents** **are** coming. (Correct—In case of *a large number of* + plural noun, the verb agrees with the plural noun. The same rule applies to: *a number of/a good number of/a lot of/lots of/several* + plural noun.)

## 3. Verb agreement with 'some'

**Some** can be either singular or plural, depending on the noun/pronoun it refers to.

- Some guests **have** already left.
- Some entertainment **is** still left.
- Some money **has** been saved.

(*Entertainment* and *money* are considered singular whereas *guests* is considered plural.)



**Important Learning:** *Each* and *every* are always treated as singular subjects.

## Incorrectly used words

### 1. Countable and uncountable nouns

Countable nouns can be quantified by numbers, while uncountable nouns can be quantified by amount.

Nouns such as soap, bread and news are uncountable, and to quantify them we use words such as: loaves/slices of bread, cakes/bars of soap, items of news and so on. 'Few' is used with countable nouns, while 'less' is used with uncountable nouns. Terms used for price, amount, age and measurement are taken as singular.

Following are examples of correct usage:

- There were fewer participants in the race this year. ('lesser participants' would be incorrect.)
- Rupees one lakh is not a lot of money. ('are not a lot of money' would be incorrect.)
- Much money was spent on the car's maintenance. ('Many money' would be incorrect.)

### 2. Usage of 'among' and 'between'

'Between' is used to refer to relationships involving only two things, while 'among' represents relationships involving several persons or things.

- Among the 40 students, she was the brightest.
- An agreement was reached between Goodland and Badland to maintain peace.

### 3. Usage of 'as' and 'like'

*As* is used both as a conjunction and as a preposition:

- The crowd rejoiced as the sun came up. (conjunction)
- India is as big as Brazil. (conjunction)
- Mr. Modi has been very successful as a chief minister. (preposition)

'Like' is generally used as a preposition and is, therefore, followed by a noun, pronoun or a gerund.

- Personalities like Gandhi still inspire people.
- There is nothing like having a hot cup of tea on a cold morning.



**Important Learning:** Use *fewer* to refer to countable things and *less* to refer to uncountable things.

## Incorrectly used idiomatic expressions

An idiom, by definition, is the commonly and universally accepted usage of a group of words that could actually have different meanings when used individually. Examples include *regarded as* (and not *regarded to be*), *forbidden to* (and not *forbidden from*), etc.

### 1. Correlative conjunctions

These conjunctions are used in pairs and follow certain grammatical rules. Following are examples: *Both... and*, *either...or*, *neither...nor*, *not only...but also*, *so...that* and so on.

- **Both** Udaipur and Jaipur are cities in Rajasthan.
- **Either** Ajay **or** Isha will lead the parade.
- **Either** the Principal **or** the teachers are going for the meeting.
- **Either** the teachers **or** the Principal is going for the meeting.

*Neither....nor* is similarly used.

- **Not only** did Mishti pass the examination, **but** she **also** earned a distinction.
- I called up Hema **not only** to inform her about the dinner, **but also** to ask her to be ready on time.
- The train was **so** crowded **that** I could not board it.
- **The** more you read, **the** more knowledgeable you become.



**Important Learning:** Every time you have a *not only* in a sentence, you need a *but also* to make it idiomatically correct. However, every time you have a *but also* in a sentence, you do not necessarily need a *not only*. The same goes for *either....or*, *neither....nor* and other correlative conjunctions.

### 2. Forms of comparison

*Between...and*, *from...to*, *so...as*, *as...as*

- **Between** the English **and** the Chinese languages, the latter is more difficult to learn.
- The government wants to build **between** 40 **and** 50 smart cities.
- The cities range **from** very small **to** very large.

## Incorrectly used modifiers

Modifiers are words or phrases that add detail or description to another word or phrase. Adjectives and adverbs are both modifiers. In the following examples, modifiers are underlined and the word/phrase they modify is highlighted in italics:

- A blue *bus*.
- The shop sold only *spices*.
- You cannot always choose where to put modifiers in a sentence.

Since the writers/speakers are clear about the context, they sometimes tend to overlook the erroneous placing of modifiers.

### 1. Misplaced modifier

This happens when the modifier appears to be modifying the wrong phrase:

- I saw a tiger while bathing.

The sentence is ambiguous since it is not clear whether *I* or the *tiger* was bathing; therefore, to make the message clear, the sentence could be rewritten as:

- While bathing, I saw a tiger.

The following sentence appears to be fine:

- I sailed in the ship with a big toolkit.

But it might convey the meaning that I sailed in a ship and the ship had a big toolkit; hence, a better sentence would be:

- I sailed with a big toolkit in the ship.

### 2. Squinting modifier

This is a modifier that can modify more than one word or phrase because the modifier is placed between two words/phrases that can both be modified by the modifier:

- I have to write a paper on furniture in my English class.

In this sentence, it is not clear whether the paper is to be on 'furniture' or on 'furniture in English class'. This may be corrected as:

- In my English class, I have to write a paper on furniture.

Another example:

- Students who attend classes regularly pass the course.

The modifier *regularly* may modify either 'attend classes' or 'pass the course'. To eliminate the ambiguity, the sentence can be rephrased as:

- Students who regularly attend classes pass the course.

### 3. Dangling modifier

A dangling modifier is one that is present in the sentence, but the word/phrase it intends to modify is missing:

- Lying on the grass, the aeroplane looked very small.

'Lying on the grass' logically describes some person and not the aeroplane, but that word is missing. This sentence can be rewritten as:

- When I was lying on the grass, the aeroplane looked very small.

#### 4. Pairing the modifier with an incorrect noun

Introductory modifying phrases, particularly when they have an 'ing' verb, commonly have an error—they refer to the incorrect noun:

- Looking out of the window, **the moon** appeared very close.
- Being a politician, **Ajay's longing for attention** is understandable
- To work efficiently in the office, **a healthy breakfast** is essential.

All the above sentences are incorrect as they imply that:

- *The moon* is looking out of the window.
- *Ajay's longing for attention* is a politician.
- *A healthy breakfast* works efficiently in the office.

To correct these sentences, pair the nearest noun with the modifying phrase like this:

- When I looked out of the window, the moon appeared very close. (I am looking out of the window.)
- Being a politician, Ajay has an understandable longing for attention. (Ajay is a politician.)
- To work efficiently in the office, you should have a healthy breakfast. (You work efficiently in the office.)

#### 5. Changing the modifier's position

Since modifiers have flexibility as to where they can be placed in a sentence, we can move around the modifier in the sentence and check if that changes the meaning of the sentence.

- My mother told me **last month** I forgot to take her to the temple.

We can see the sentence can convey two different messages and hence has an error. To correct the sentence, change the placement of the modifier:

- **Last month**, my mother told me that I forgot to take her to the temple.
- My mother told me that I forgot to take her to the temple **last month**.

#### 6. Proximity

The modifier should be placed closest to the word/phrase it is intended to modify and away from other words/phrases it could be confused to be modifying. In the following examples, the meaning of the sentences changes depending on the proximity of the modifier 'only' to other words/phrases:

- **Only Nirma** can wash the clothes. (Nothing else can wash clothes.)
- Nirma can **only wash** the clothes. (Nirma cannot do anything other than wash.)
- Nirma can wash **only the clothes**. (Nirma cannot wash anything other than clothes.)



**Important Learning:** A modifier/modifying phrase must always touch the noun that it modifies or refers to.

## Parallel structure

Parallel structure requires matching the phrases, clauses, verbs and other elements in a sentence. For example:

- Jerry likes walking and to swim.

In this sentence, the gerund *walking* is not parallel to the infinitive *to swim*. The correct sentence will read as:

- Jerry likes walking and swimming.

or

- Jerry likes to walk and to swim.

Now, let's look at another sentence:

- Tom can go to his school by bus, train or cab.
- Tom can go to his school by bus, train or by cab.
- Tom can go to his school by bus, by train or by cab.

The first option is correct, since it is implied that 'by' applies to the other two options as well; the third option is also correct for the same reason (albeit wordy). However, the second option is incorrect because it implies that 'by' is needed only for the bus and the cab and not needed for the train. So, as stated earlier, consistency is the key to identifying and answering parallel structure questions.

### Parallel Structure with Correlative Conjunctions

Errors of parallelism are common when using correlative conjunctions. Following are a few examples:

- It was both a long journey and tiring. (Incorrect)
- The journey was both long and tiring. (Correct)
- Either you must play with him or he will go to sleep. (Incorrect)
- You must either play with him or let him sleep. (Correct)
- You must play with him or he will go to sleep. (Correct)
- His concerns were, first, the absence of a plan and second, there was disregard of discipline. (Incorrect)
- His concerns were, first there was no plan; second, disregard of discipline. (Incorrect)
- His concerns were, first, the absence of a plan; second, disregard of discipline. (Correct)

### Parallel Structure in Comparisons

- His qualifications are better than me. (Incorrect)
- His qualifications are better than my qualifications. (Correct)
- His qualifications are better than mine. (Correct)
- The preparation for Civil Services is more demanding than Bank Probationary Officer Test. (Incorrect)
- The preparation for Civil Services is more demanding than the preparation for Bank Probationary Officer Test. (Correct)



**Important Learning:** If you see a sentence starting with *like* or *unlike*, you are most definitely being tested on the Comparison error.

## Redundancy

Phrases such as *revert back*, *free gift*, *12 midnight* have redundancy since they contain words that do not convey any additional information. Following are some examples:

- We will succeed only if we cooperate together. (Wordy)
- We will succeed only if we cooperate. (Concise)
- In the case of this legislation, it had a negative effect on the party's popularity. (Wordy)
- This legislation had a negative effect on the party's popularity. (Concise)
- The management is already in the process of amending the rules. (Wordy)
- The management is in the process of amending the rules. (Concise)
- Each of the tribes in Central India is very unique. (Incorrect)
- Each of the tribes in Central India is unique. (Correct)



**Important Learning:** All other things remaining the same, a shorter or more concise option is always preferred to a longer one.

## Using the correct tense of the verb

The verbs need to agree with the time frame of the events described in the sentence. Following are some of the important tenses tested on the NMAT by GMAC™:

1. **Simple tenses:** Simple tenses are used to show habitual or frequent actions, actions occurring at the moment or to state generally accepted facts.
  - **Simple past:** The simple past tense is used to talk about actions that happened at a specific time in the past. You form the simple past tense of a verb by adding 'ed' at the end of a regular verb (irregular verb forms are different) or by using the helping verbs *was/were*.
    - I saw a play yesterday.
    - She washed her car this morning.
    - Did you complete your assignment?
    - She was here for a class yesterday.
  - **Simple present:** The simple present tense is used to discuss permanent situations and how frequently an event takes place. This tense typically involves the use of *is/are* or words ending with *s* such as *rises*, *comes* and so on.
    - I like to read books.
    - The earth **is** round.
    - The bus leaves at 10 pm.
  - **Simple future:** The simple future tense has two different forms in English: *will* and *be going to*. Use *will* to express a voluntary action or a promise.
    - I will send you the report when I get it.
    - I will translate the email, so that Jerry can read it.
    - I won't tell anyone your secret.

Use *be going to* to express a plan:

- He **is going to** spend his holidays in Jamaica.
- Whom are you **going to** invite to the dinner?

2. **Perfect tenses:** These tenses represent action that has already been completed. Important forms of the Perfect tense are:

- **Present perfect:** This represents an action that began and finished at an indefinite period in the past. The helping verbs 'have/has' are used.
  - I **have** read the works of Vivekanand.
  - She **has** sung in the choir since she was just 3 years old.
  - The workers **have** painted the walls.
- **Past perfect:** The verb is used with 'had' to express earlier of the two events that occurred in the past. Here are some examples:
  - When I reached the market, the shops **had** closed. (The shops had closed before I reached the market.)
  - By the time I got ready, the taxi **had** arrived. (The taxi arrived before I got ready.)
- **Future perfect:** The verb is used with 'will have' to express two events that will happen at different points of time in the future.
  - When the college ends, I **will have** mastered Coordinate Geometry. (Mastering of Coordinate Geometry will happen before the college ends.)
  - By the end of the year, India **will have** sent two more rockets into space. (India will send two more rockets into space before the year ends.)

3. **Continuous/Perfect continuous tenses:** Progressive or continuous tenses express continuous or repeated actions.

- **Present continuous:** The verbs are used with *am/is/are* to represent a continuing action in the present.
  - It **is** raining heavily.
  - I **am** travelling to Delhi with my mother.
  - The children playing in the garden **are** making a lot of noise.
- **Past continuous:** The verbs are used with *was/were* and represent a continuing action in the past.
  - The machine **was** running when the power went off.
  - The alarm bells **were** ringing loudly.
- **Present perfect continuous:** The verbs are used with *has been/have been* and represent a continuing action that began in the past and continues into the present.
  - The masses **have been** hoping for a turnaround in their fortunes.
  - The students **have been** taking classes from me.
- **Past perfect continuous:** The verbs are used with *had been* and represent a continuing action that was completed in relation to another event in the past.



- When I reached home, my children **had been waiting** for me.
- The villagers **had been preparing** to brace up for the storm before the torrential rains started.

### Using the right adjectives

**Many** is used before plural countable nouns while **much** is used before uncountable nouns:

- Anu did not have **much** experience.
- On the way, she made **many** mistakes.
- **Much** time was wasted on unproductive tasks. (Considerable amount of time.)

**Little** is used for uncountable nouns while **few** for countable nouns.

- There is **little** milk left.
- Only a **few** bottles of milk are there.



**Important Learning:** Tense questions test you on your understating of the time period(s) mentioned in the sentence, so make sure that you focus on the non-underlined part of the sentence as well to get the sequence of time periods correct.

### 3 Choosing the Correct Preposition

In this question type, you will be given three separate sentences with one blank in each. Below these sentences, you will be given 6 prepositions labelled (a) to (f). Finally, you will be given five answer choices with some possible combinations of these prepositions. You need to identify the combination that can correctly go into each of the three blanks.

Let us take a look at an example:

1. There are three members \_\_\_\_\_ the ICC's anti-corruption committee, one of whom is from India.
  2. The thieves broke into the house, ransacked the almirahs and decamped \_\_\_\_\_ all the loot.
  3. There are few pleasures that can rival the joy of dancing \_\_\_\_\_ the season's first rains.
- (a) in  
(b) from  
(c) on  
(d) by  
(e) with  
(f) to

#### Answer Choices

- (A) aeb  
(B) cae  
(C) cea  
(D) edc  
(E) dea

**Answer: (C)**

As you can see, these questions are not testing you on any specific grammar rule as such; rather, they are testing you on the usage of words and phrases. It again helps if you have been in the habit of reading as you may then be able to recall the correct use of these prepositions. If you are not in the habit of reading, it makes sense to start reading a good newspaper or magazine.

## 4.8 Comprehension

## 4.9 What is Measured?

The comprehension section will test your ability to read, comprehend and interpret unfamiliar content and to answer questions about the same.

You will be tested on your understanding of the English language, your word power and your ability to comprehend jumbled up text.

## 4.10 Overall Test Taking Strategies

- While reading passages, focus on the comprehension aspect and not on the speed aspect.
- Do not panic if the passage looks lengthy or difficult to comprehend. To ensure you are able to make best use of time, make use of the strategies provided in the following section.
- Try to make a passage map for every passage and predict the topic and purpose before you attempt the questions.
- Do not use your knowledge or common sense to answer questions. Only answer on the basis of what is given in the passage.
- While attempting parajumble questions, try to create a link between two options and eliminate wrong answer choices.

The next few sections will provide you with in-depth strategies for approaching each topic.

# 1 Introduction

Comprehension or the ability to make sense of some randomly assigned block of text will primarily be tested on two question types on the NMAT by GMAC™—Reading Comprehension and Parajumbles.

## 2 Reading Comprehension

As the name suggests, Reading Comprehension (RC) questions will test you on your understanding or comprehension of unfamiliar texts from short or long passages. Each passage will be followed by a few questions related to that passage. On an average, you will see two Reading Comprehension passages on the NMAT by GMAC™ with three to four questions on each passage. The passages are typically 300–400 words in length, though they can at times be longer or shorter.

### How much time should you spend on each passage?

You will need to complete 32 questions in 22 min in the verbal section. Thus, you roughly have 40 sec for each question. However, RC questions will take you a little longer to answer, so you must save time while answering Vocabulary and Grammar questions.

Ideally, you should take at the most 30 sec for each of the Vocabulary and Grammar questions, which will leave you with 10 min to answer the eight or so Reading Comprehension questions.

### Nature of passages

The passages that you see on the NMAT by GMAC™ will primarily be from the following subject areas:

- Physical Sciences
- Social Sciences
- Humanities
- Business and Economics

The passages will not always be interesting or fun to read; as a matter of fact, some of them may seem to be boring and difficult to understand. The language of the passages will be similar to what you are likely to see in publications such as *The Guardian* and *The Economist*.

The problem most students face on RC is that they have to go through text from areas they are not conversant with and answer questions based on this. The moment you see a passage from an unfamiliar area, you immediately start telling yourself that you will do badly on this passage because you have no idea about the subject matter. If you start with this negative thought process, you will obviously not be setting yourself up for success.

Please keep in mind that you are not expected to have any prior knowledge of the topic. All the information that you need to answer the questions is available in the passage in front of you. You just need to comprehend the passage and select the correct answer from the options provided. In fact, there is a negative aspect of getting passages from within your comfort area, which will be discussed later in this chapter.

### How not to approach RC passages

Whenever we read some text, it is human tendency to focus on the facts that have been provided. We tend to focus on specific details, numbers and dates, but in the process end up missing out on the big picture, which provides the answer to the question 'why?'. Why has the author provided these figures or details? The answer to this question will reveal the author's purpose behind writing this passage. If you concentrate on the details and miss out on this 'why' aspect, you will always struggle to answer RC questions correctly.

This is because most questions will not always directly ask you something that is clearly mentioned in the passage; rather, the questions at times can be more indirect in nature. The answer to most of the questions will not be clearly stated in the passage, so it does not make sense to spend valuable time trying to absorb all the details mentioned in the passage.

 **Important Learning:** While reading RC passages on the NMAT by GMAC™, focus on the *WHY* and not on the *WHAT*.

## Make a passage map

A good way of approaching a passage, especially a long one, is to make a map of the passage. A passage map is nothing but one or two lines for every paragraph in the passage, highlighting *why* the author has written that paragraph. Note that the passage map does not have to highlight *what* the author has written but rather *why* he has written what he has written, which means that the points in your passage map should always start with verbs such as *describe*, *explain*, *praise*, *criticize*, *condemn* and so on. Most of the time, you will find this information in either the first or the last sentence of each paragraph. Students often tend to focus on the middle part of paragraphs (which contains all the details). So, please make a conscious effort to go back and read the first and the last sentence of every paragraph so as to develop a perspective of *why* the author is writing what he is writing.

## Topic, scope and purpose

Apart from the passage map, there are three more things you need to be absolutely clear about before you look at the first question—the Topic, the Scope and the Purpose of the passage.

The Topic of the passage is nothing but a word or a phrase that captures the essence of the passage. The topic tells you what is the subject matter around which the passage revolves. The NMAT by GMAC™ will rarely ever ask you to identify the topic of the passage; this is more for your understanding of the passage.

The Scope of the passage basically tells you what aspect of the topic is the passage concerned with. The understanding of the scope becomes important because this helps you quickly eliminate incorrect options.

The Purpose is the most important part of the passage and will answer the question—*why did the author write the entire passage?* When thinking about the purpose, think on three lines—is the author positive, that is, is he trying to praise or support something; is the author negative, that is, is he trying to criticize something; or is the author simply neutral, that is, is he just describing or explaining something. Obviously, this will also clarify the tone of the passage for you. If you are clear about the purpose of the passage, you will not have to keep referring back to the passage to check each option; rather, you will be able to eliminate a lot of the options just by looking at them because they contradict the author's primary purpose.

For example, if you know that the main purpose of the author is positive, and there is a question asking you to select from five options that one option the author would most likely agree with, then you can immediately eliminate options with negative connotations because the author has a positive agenda. Thus, identifying the purpose correctly will save you a lot of time on NMAT by GMAC™ RC and also make you more confident of your eliminations.

## Avoid making this mistake

A common mistake students make while preparing a passage map is to make notes for every sentence in a paragraph. They will read one sentence and make a note for that sentence, and then come back and read the next sentence and again make a note for it and so on. Needless to say, this is an absolute waste of time and beats the purpose of making the passage map in the first place.

As stated earlier, the passage map should answer the *why* and not the *what*. You do not have to write any details in the passage map. The details are already there in front of you on your screen and you can refer to them whenever a question requires you to do so. You do not even have to try to understand everything that is written in the paragraph, as long as you are able to understand why the author has written what he has written.

For example, a paragraph could start by stating that there are two theories put forward by economists to explain how the foreign exchange markets work. The rest of the paragraph could go into explaining these two theories out of which one you may not have understood. This is fine; do not waste your time re-reading the paragraph, just move on to the next paragraph. If there is any question on this particular theory, then you can always come back and read this part again, else you would have wasted your valuable time. It is this kind of common sense that will be rewarded on the NMAT by GMAC™.

### Do not confuse the author's views with his statements

While reading the passage, be careful to differentiate between when the author is stating something and when the author is attributing a comment to somebody else. For example, if the author were to make a statement, such as *Critics of the Theory of Relativity believe that the theory is incorrect*, do not construe this as the author criticising anything. The author is merely providing you the opinion of the critics and is neutral himself.

This is especially true in the case of passages in which the author is reviewing the work of some other author or individual. In such passages, make sure that you also read the questions properly because some questions could be from the point of view of the author of the passage while some others could be from the point of view of the author or scholar whose work is being evaluated.



**Important Learning:** While reading passages, make sure you keep a track of when the author is saying something and when he is attributing a comment to someone else.

### Engage with the passage—do not read passively

While reading, try to engage with the passage. This will also help prevent your concentration from wandering. The best way to get yourself involved with the passage is to try to predict what will come next in the passage. When you do this, you are essentially putting yourself in the author's shoes and thinking like him, which will help you get a greater understanding of the passage. Use the last sentence of a paragraph to predict what will come in the next paragraph.

For example, if the paragraph ends by stating that scientists have proposed a solution for a problem, the next paragraph will most probably provide you with the details of this solution. Once you see that most of your predictions are turning out to be correct, you will find it more fun to read the passage and you will also notice an increase in your confidence level as you go about tackling the questions.

### Make use of transition words

While making a passage map or generally reading a passage, try to make use of transition words to understand the overall structure of the passage and also to predict what will happen next in the passage. For example, if the author starts a paragraph with the words *Similarly* or *Likewise*, then you immediately know that whatever he has described in the earlier paragraph, the same thought process will continue in this paragraph as well.

Contrastingly, if the author is praising something in a paragraph, and the next paragraph starts with the words *However* or *Despite*, then you immediately know that the author will now talk about some negative

or contrasting aspect of that thing. Transition words will make it very easy for you to understand the broad structure of a passage; these will mostly be found in the first and the last sentence of a paragraph, so pay attention to these sentences.

### 3 NMAT by GMAC™ Reading Comprehension Question Types

#### Global questions

Global questions are questions that cannot be answered by reading from the passage, that is, the answer is not written in the passage. The main purpose/primary concern type questions will fall under this question type. Here are a couple of examples:

- What is the main purpose of the author in writing the passage?
- What is the primary concern of the third paragraph in the passage?

Note that a passage will never tell you what its main purpose is. However, if you have made a good passage map, then you should not have much difficulty in answering this question. Also remember that, since the answer is not given in the passage, you do not really need to go back to the passage to answer a Global question. This will also save you time.

A trick to answering Global questions in NMAT by GMAC™ is to make use of the fact that each of the options in such questions will start with a verb, which will have a positive, negative or neutral connotation. Thus, if you are clear on the author's tone, you should be able to eliminate two or three options immediately just by looking at the first word of every option.

For example, if you know that the author's tone is neutral, then options that start with words, such as *arguing, praising, criticising* and so on, will never be correct because these have either a positive or a negative connotation. The correct answer in this case would start with neutral words such as *describe, explain, analyse* and so on.



**Important Learning:** The answer to a Global question is never given in the passage, so do not waste your time searching for the answer in the passage.

#### Detail questions

As the name suggests, Detail questions will ask you questions related to what is explicitly mentioned in the passage. In that sense, they are the opposite of Global questions, as the answer to these questions will always be stated in the passage. So, make sure that you go back and read the answer from the passage before selecting an option. This is where a good passage map comes in handy while tackling long passages because you do not have to waste time trying to find the answer in the entire passage. Here are two examples of

Detail questions:

- Which of the following is provided by the author as an example of reverse osmosis?
- Each of the following is mentioned in the passage as a side effect of medicine EXCEPT:

#### Use of EXCEPT on Detail questions

Since the answer to a Detail question is always written in the passage, it might seem that these questions would be relatively easier to answer. However, the test maker has a way of making these questions confusing and lengthy by the use of words such as 'EXCEPT'.



For example, a question may state that *According to the passage, each of the following is true of a steam turbine EXCEPT*.

In this case, four of the options will be mentioned in the passage and you will need to identify the fifth option that is not mentioned in the passage. Thus, you need to check each of the options against the information in the passage, which makes the entire exercise take longer than would a regular question.

Also, the wording of the options will be confusing, in the sense that there will not be that one option which contains words that have never been mentioned in the passage (thereby, making it easy for you to identify this as the correct answer). Rather, all the options will contain keywords from the passage; it is just that one of them will convey some incorrect information about the keyword. Thus, make sure that you read every option with a critical eye.

### Vocabulary-in-context questions

These questions will ask you to identify the meaning of a word or a phrase as used in the passage. The keyword here is *in context*, that is, the answer always has to be with reference to the passage. The dictionary meaning of the word will rarely be the correct answer; in fact, this is one of the most common wrong answer traps.

To answer these questions correctly, go back and read the sentence which contains this word or phrase. Then, read one or two sentences before and after this sentence to get an idea of the context. Now, look at each option and eliminate. Here are a couple of examples of vocabulary-in-context questions:

- What is the meaning of the word 'explosion' as used in the passage?
- The word 'cynosure', as used in the passage, is closest in meaning too.



**Important Learning:** The answer to a vocabulary-in-context question will almost never be the literal or dictionary meaning of the word.

### Function questions

Function questions will ask you to identify the function of a word, a sentence, a paragraph, a punctuation mark and so on in the context of the overall passage. These are essentially *Why* questions, that is, they will ask you why the author uses a particular word or sentence in the passage. To answer these questions correctly, you will need to put yourself in the author's shoes and think like the author. Obviously, the understanding of the main purpose of the passage becomes crucial while answering these questions.

Please remember that the question is not asking you for your opinion on something, as this is what students end up providing most of the time. It is asking you for the author's rationale behind writing something in the passage.

Function questions will either start with the interrogative *Why* or they will end with the phrase *in order to*.

Here are a couple of examples of Function questions:

- Why does the author provide the example of the atomic clock in the passage?
- The author provides the example of the atomic clock in the passage in order to.


### Inference questions

The dictionary meaning of the term 'Inference' is to derive by reasoning, and this is exactly what you will be required to do on Inference questions—arrive at an answer that is not explicitly stated in the passage.

but that can be definitely concluded given the information in the passage. So, Inference questions will require you to arrive at an answer that can be concluded or stated, based on the information provided in the passage. The answer to these questions will never be directly stated in the passage.

Inference is an important question type tested on NMAT by GMAC™ Reading Comprehension, and is also the question type on which students make the most mistakes. This is because students often tend to read too much between the lines, that is, they end up over-inferring from the passage. Hence, make it a point to avoid strongly worded or extreme-sounding options—options containing words such as *must be true*, *always be the case*, *never be the case*, *cannot be determined* and so on—and go with more open ended and vague options—options containing words such as *usually*, *sometimes*, *possibly*, *might be true* and so on. Here are a couple of examples of Inference questions:

- Which of the following is implied by the author in the fourth paragraph?
- Which of the following options would the author of the passage most likely agree with?

 **Important Learning:** While attempting Inference questions, always avoid extreme or strongly worded options.

## 4 Parajumbles

As the name suggests, Parajumbles are simply jumbled paragraphs. In this question type, you will be given four or five separate sentences labelled (a) to (d)/(e). You will have to arrange these sentences in such a manner that the whole thing turns into a cohesive logical paragraph. Let's take a look at an example.

Choose the most logical order of sentences from the given choices to construct a coherent paragraph:

- (a) At this point, banks want to lend even less because of the uncertainty generated from bankruptcies.
- (b) Most businesses require loans for their normal operations.
- (c) Some of these businesses eventually go bankrupt and banks experience further problems as their balance sheet deteriorates due to non-performing loans.
- (d) As they curtail production, they demand fewer products from their suppliers, and therefore their suppliers have to reduce their output and fire workers.
- (e) When the banking sector does not work properly, businesses cannot get loans, and they have to curtail their production and lay off workers.

- (A) abdcce
- (B) bedca
- (C) becda
- (D) ebdca
- (E) edcba

The best way to approach parajumble questions is to quickly scan the sentences and try to make a connection between any two of them.

For example, if we can decide that (d) should come immediately after (e), then we have narrowed down our choices to only those options that contain the sequence ed.

It helps to look out for pronouns in the options. For example, sentence (d) starts by saying *as they curtail production*. The use of the pronoun *they* suggests that this sentence should come after a sentence in which an antecedent for *they* has been mentioned. Looking at the other options, this antecedent should most likely be *businesses*. Using the information in sentence (e), it can easily be concluded that (d) needs to come immediately after (e). Thus, we have another sequence ed. This immediately narrows our choices to options (B) and (E).

Then, it is a simple matter of reading out the sentences in the order of both these options and selecting the one that makes more sense.

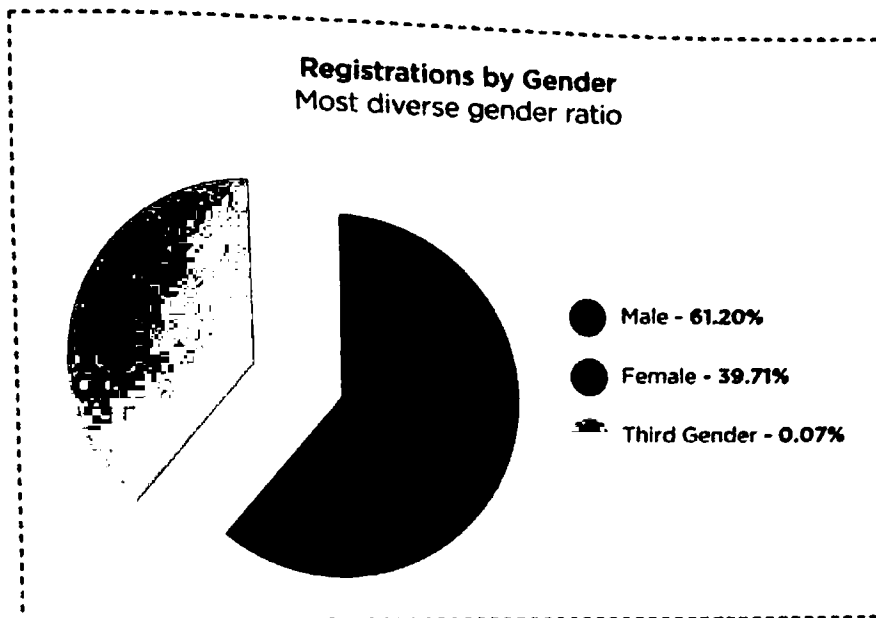
In option (E), the placement of (b) after (c) makes no sense. The placement of (b) looks much more logical in (B). Thus, (B) is the correct answer.

So, as you can see, it is never a good idea to go through all the given choices in a parajumble question. Among other problems, this will take too much time and time is a precious resource on the NMAT by GMAC™. Instead, you first try to make a connection between two options, and then use this to narrow down your choices.

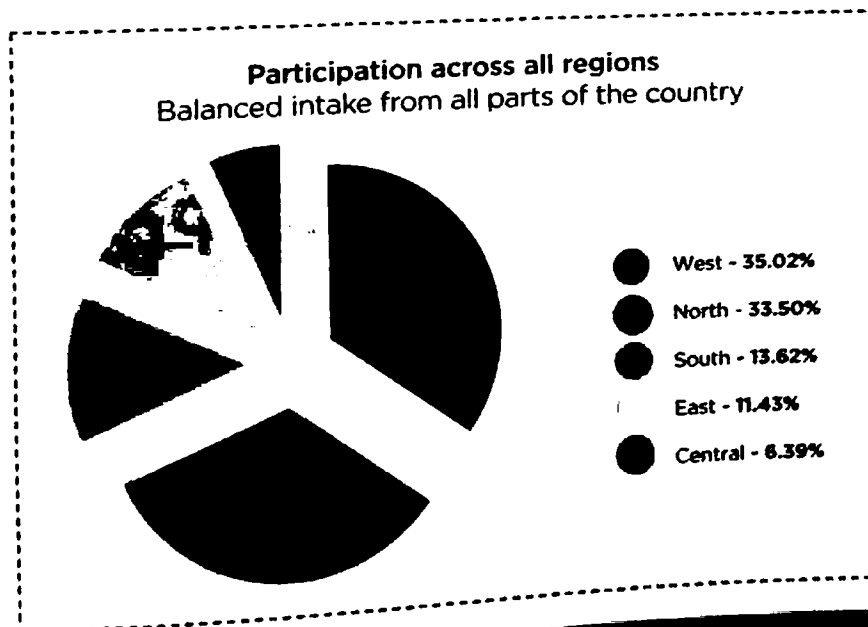
Some of the ways of making this connection could be as follows:

1. Using transition words such as *thus, however, similarly, consequently* and so on.
2. Using pronouns such as *he, she, they, these* and so on.
3. Using timelines mentioned in the options.
4. Using acronyms. If both the full form (Reserve Bank of India) and short form (RBI) of something is mentioned in the options, then the short form has to come after the full form.
5. Looking for the use of examples in the options. This option will always have to be preceded by whatever it is an example of.

## NMAT by GMAC™ Test Taker Data (2016)



NMAT by GMAC™ 2016 again witnessed the most diverse gender ratio with 39.71% representation of women



NMAT by GMAC™ 2016 remained the popular choice of candidates from all parts of the country

UNIT 1: Introduction to the Course (10-15 min)

Section 1: Welcome to the Course



Section 2: Course Objectives

Section 3: Course Structure

## 5.0 Language Skills Practice

- Section 1: Grammar
- Section 2: Vocabulary
- Section 3: Reading
- Section 4: Writing

# 1 Antonyms

Select the word or phrase that is nearly the opposite in meaning to the word given in the question stem.

## 1. RESTIVE

- (A) Craven
- (B) Anxious
- (C) Calm
- (D) Vigorous
- (E) Agile

## 2. PARTIAL

- (A) Disinterested
- (B) Biased
- (C) Apprehensive
- (D) Naive
- (E) Recondite

## 3. DIVULGE

- (A) Reveal
- (B) Evaluate
- (D) Refine
- (D) Store
- (E) Hide

## 4. PUERILE (Real NMAT Question)

- (A) Childish
- (B) Mature
- (C) Pure
- (D) Silly
- (E) Viral

## 5. CLANDESTINE

- (A) Destiny
- (B) Secret
- (C) Cataclysmic
- (D) Overt
- (E) Unaware

## 6. CONTENTIOUS

- (A) Arguable
- (B) Agreeable
- (C) Similar
- (D) Controversial
- (E) Truculent

## 7. LOQUACIOUS

- (A) Verbose
- (B) Voluble
- (C) Sceptical
- (D) Taciturn
- (E) Ruddy

## 8. PEJORATIVE

- (A) Derogatory
- (B) Nugatory
- (C) Complimentary
- (D) Simple
- (E) Oratorical

## 9. RELINQUISH

- (A) Abandon
- (B) Prevaricate
- (C) Renege
- (D) Abdicate
- (E) Continue

## 10. EMACIATED

- (A) Corpulent
- (B) Emancipate
- (C) Luminous
- (D) Verbose
- (E) Tawdry

## 11. AMALGAMATE

- (A) Merge
- (B) Divide
- (C) Allay
- (D) Absolve
- (E) Endure

## 12. STOIC

- (A) Indomitable
- (B) Agitated
- (C) Sycophant
- (D) Serene
- (E) Impassive

**13. PERNICIOUS (Real NMAT Question)**

- (A) Useful
- (B) Harmless
- (C) Profitable
- (D) Healthy
- (E) Wholesome

**14. MYOPIC**

- (A) Hypochondriac
- (B) Vindictive
- (C) Bigoted
- (D) Self-centered
- (E) Far-sighted

**15. BLITHE**

- (A) Dim-witted
- (B) Flexible
- (C) Agile
- (D) Solemn
- (E) Laconic

**16. ABROGATE (Real NMAT Question)**

- (A) Promulgate
- (B) Suggest
- (C) Finalise
- (D) Initiate
- (E) Ratify

**17. MALADROIT**

- (A) Healthy
- (B) Joyous
- (C) Skilled
- (D) Inept
- (E) Injudicious

**18. LOCAL**

- (A) Regional
- (B) Wide
- (C) Tendentious
- (D) Catholic
- (E) Limited

**19. RECALCITRANT (Real NMAT Question)**

- (A) Contumacious
- (B) Convincing
- (C) Incurrigible
- (D) Tractable
- (E) Contrary

**20. CONSTRICT**

- (A) Bellow
- (B) Sublime
- (C) Reject
- (D) Submerge
- (E) Dilate

**21. ASSUAGE (Real NMAT Question)**

- (A) Point
- (B) Add On
- (C) Aggravate
- (D) Ameliorate
- (E) Accentuate

**22. EXCULPATE**

- (A) Exonerate
- (B) Prove guilty
- (C) Show anxiety
- (D) Avoid responsibility
- (E) Ameliorate

**23. LIMPID (Real NMAT Question)**

- (A) Pellucid
- (B) Opaque
- (C) Insipid
- (D) Lucent
- (E) Lucid

**24. INSULAR**

- (A) Unbiased
- (B) Circumscribed
- (C) Isolated
- (D) Dispassionate
- (E) Insouciant

## 2 Analogies

In the following questions, a related pair of words or phrases is followed by five pairs of words or phrases. Choose the pair that best expresses a relationship similar to that in the original pair.

### 1. CRIME : POLICE

- (A) Watchman : Theft
- (B) Food : Eat
- (C) Weight : Exercise
- (D) Flood : Dam
- (E) Play : Football

### 2. CLEAVER : BUTCHER

- (A) Screwdriver : Mechanic
- (B) Treadmill : Runner
- (C) Pen : Writer
- (D) Scalpel : Surgeon
- (E) Brush : Painter

### 3. EXPAND : AREA

- (A) Bend : Flexibility
- (B) Noxious : Escape
- (C) Drone : Monotonous
- (D) Proliferate : Number
- (E) Length : Increase

### 4. CRITIC : FAULT

- (A) Artist : Praise
- (B) Amateur : Persevere
- (C) Athlete : Practice
- (D) Arbitrator : Mediate
- (E) Thief : Arrest

### 5. ACROBAT : AGILITY

- (A) Engineer : Clarity
- (B) Student : Perseverance
- (C) Surgeon : Dexterity
- (D) Entrepreneur : Capital
- (E) Lawyer : Courtroom

### 6. JOY : EUPHORIA

- (A) Misery : Sorrow
- (B) Triumph : Ecstasy
- (C) Write : Type
- (D) Punish : Scold
- (E) Anger : Wrath

### 7. CAPTAIN : SHIP

- (A) Teacher : School
- (B) Manager : Office
- (C) Guide : Tourist
- (D) Doctor : Hospital
- (E) Hotel : Concierge

### 8. DEBACLE : FAILURE

- (A) Disaster : Catastrophe
- (B) Steal : Theft
- (C) Carrot : Vegetable
- (D) Murder : Crime
- (E) Ecstasy : Joy

### 9. DISLIKE : LOATHE

- (A) Pain : Discomfort
- (B) Coward : Foolhardy
- (C) Disquiet : Anxious
- (D) Fear : Stress
- (E) Joy : Ecstasy

### 10. LIQUID : MELT

- (A) Gas : Vaporise
- (B) Criminal : Arrest
- (C) Tourist : Travel
- (D) Ice : Freeze
- (E) Scholar : Study

### 11. SPECIOUS : VERACITY

- (A) Corruption : Scruples
- (B) Wealth : Money
- (C) Variegation : Colour
- (D) Enervation : Nervous
- (E) Locomotion : Movement

### 12. ALTRUISTIC : SELFISHNESS

- (A) Enlightened : Wisdom
- (B) Befuddled : Clarity
- (C) Flippant : Calm
- (D) Assiduous : Diligence
- (E) Depressed : Sorrow



**13. TRIM : HAIR**

- (A) Shave : Beard
- (B) Prune : Hedge
- (C) Reap : Crop
- (D) Dismiss : Guilt
- (E) Admonish : Scold

**14. EULOGY : PRAISE**

- (A) Rant : Fear
- (B) Heretic : Convention
- (C) Lambast : Redeem
- (D) Elegy : Lament
- (E) Catastrophe : Trauma

**15. REPRIMAND : CENSURE**

- (A) Cower : Menace
- (B) Jeer : Derision
- (C) Fidget : Caution
- (D) Alert : Vigilant
- (E) Resistance : Violence

**16. EXIGENCY : CRISIS (Real NMAT Question)**

- (A) Liberty : Rights
- (B) Captivity : Prison
- (C) Curfew : Sundown
- (D) Mayhem : Rush-hour
- (E) Preparedness : Eventuality

### 3 Synonyms

Select the word or phrase that is nearest in meaning to the word given in the question stem.

1. EXPENDABLE

- (A) Gushing
- (B) Anomaly
- (C) Dejected
- (D) Superfluous
- (E) Parsimonious

2. SERENDIPITY

- (A) Pity
- (B) Sympathy
- (C) Good luck
- (D) Sarcasm
- (E) Reclusive

3. DISTRAUGHT

- (A) Subservient
- (B) Composed
- (C) Authoritative
- (D) Dogmatic
- (E) Agitated

4. PHILANTHROPY

- (A) Charity
- (B) Philander
- (C) Flounder
- (D) Misanthrope
- (E) Anathema

5. HYPERBOLE

- (A) Infestation
- (B) Exaggeration
- (C) Compression
- (D) Generosity
- (E) Greed

6. TENDENTIOUS (*Real NMAT Question*)

- (A) Aberrant
- (B) Partisan
- (C) Incoherent
- (D) Meticulous
- (E) Surreptitious

7. HARBINGER

- (A) Kleptomaniac
- (B) Vagabond
- (C) Catholic
- (D) Precursor
- (E) Successor

8. EXIGENT

- (A) Lax
- (B) Deferrable
- (C) Critical
- (D) Routine
- (E) Heroic

9. JEER

- (A) Compliment
- (B) Cheer
- (C) Mock
- (D) Castigate
- (E) Flatter

10. RELENTLESS

- (A) Lenient
- (B) Dogged
- (C) Painstaking
- (D) Intermittent
- (E) Ephemeral

11. TENUOUS

- (A) Substantial
- (B) Nervous
- (C) Rude
- (D) Flimsy
- (E) Attenuate

12. ABATE

- (A) Obdurate
- (B) Ossify
- (C) Preclude
- (D) Elevate
- (E) Lessen

**13. TUMULTUOUS (Real NMAT Question)**

- (A) Blissful
- (B) Flagrant
- (C) Odious
- (D) Opulent
- (E) Turbulent

**14. LATENT**

- (A) Overt
- (B) Hidden
- (C) Casual
- (D) Bellicose
- (E) Ubiquitous

**15. CORROBORATE**

- (A) Corrupt
- (B) Abdicate
- (C) Denigrate
- (D) Substantiate
- (E) Abnegate

**16. ADVERSITY (Real NMAT Question)**

- (A) Boredom
- (B) Hardship
- (C) Dynamics
- (D) Monotony
- (E) Dishonesty

**17. FALLOW**

- (A) Fertile
- (B) Lush
- (C) Barren
- (D) Vigorous
- (E) Ruddy

**18. PILLORY (Real NMAT Question)**

- (A) Broach
- (B) Dampen
- (C) Placate
- (D) Relegate
- (E) Disparage

**19. PROCLIVITY**

- (A) Dislike
- (B) Passion
- (C) Prehensile
- (D) Anachronistic
- (E) Predisposition

**20. ADDLE**

- (A) Combine
- (B) Discreet
- (C) Befuddle
- (D) Abject
- (E) Obdurate

**21. TRITE**

- (A) Innovative
- (B) Exiguous
- (C) Hackneyed
- (D) Opportune
- (E) Pertinent

**22. DWINDLE**

- (A) Enhance
- (B) Ebb
- (C) Voracious
- (D) Diminish
- (E) Surge

## 4 Fill in the Blanks

Each of the sentences below consists of one blank or two blanks. Choose the word or set of words for each blank that best fits the meaning of the sentence as a whole.

1. One requirement of a good book is that it deepen and extend our knowledge, not that it merely \_\_\_\_\_ what we already know.  
 (A) enhance  
 (B) confirm  
 (C) modify  
 (D) reduce  
 (E) vilify
2. Some people might believe that measuring sleepiness is a fairly \_\_\_\_\_ task, but it is of paramount importance to a sleep researcher.  
 (A) easy  
 (B) trivial  
 (C) straightforward  
 (D) arduous  
 (E) noisome
3. As soon as \_\_\_\_\_ with an aerial salt, water is formed. (*Real NMAT Question*)  
 (A) basic reaction  
 (B) a base reacts  
 (C) a base will react  
 (D) a base is reacting  
 (E) the reaction of a base
4. There are many things to be said against American newspapers, but much of the \_\_\_\_\_ is \_\_\_\_\_ when one considers that every now and then they develop a great writer like Don Marquis.  
 (A) blandishment; kindled  
 (B) somnolence; underscored  
 (C) indictment; quashed  
 (D) criticism; upheld  
 (E) applause; negated
5. Even though human beings \_\_\_\_\_ in certain aspects, fundamentally they are similar.  
 (A) coexist  
 (B) differ  
 (C) quarrel  
 (D) agree  
 (E) astound
6. While there is no doubt that Manchester City is \_\_\_\_\_ (i) \_\_\_\_\_ football team, whether they are able to perform to their \_\_\_\_\_ (ii) \_\_\_\_\_ in the upcoming Premier League season remains to be seen.  
 (A) a boring.....talent  
 (B) a good.....detriment  
 (C) an average.....capability  
 (D) an excellent.....potential  
 (E) an upcoming.....spectators
7. Allergy to gluten has become surprisingly common in recent times. Even the products made by companies that do not use any gluten in their manufacturing process \_\_\_\_\_ (i) \_\_\_\_\_ be considered completely \_\_\_\_\_ (ii) \_\_\_\_\_ since there is no guarantee that gluten will not be present in the raw materials that these companies use to make their products.  
 (A) cannot.....benign  
 (B) should.....unsafe  
 (C) will not.....vulnerable  
 (D) claim to.....harmless  
 (E) are not to.....inconspicuous
8. Jonathan wanted to \_\_\_\_\_ psychology as his major, but his parents wanted him to study engineering. (*Real NMAT Question*)  
 (A) cope  
 (B) attest  
 (C) choice  
 (D) enrich  
 (E) declare
9. The judges for the cooking show were true \_\_\_\_\_, noting subtle differences between dishes that most people would not detect.  
 (A) dilettantes  
 (B) iconoclasts  
 (C) neophytes  
 (D) gourmands  
 (E) dissidents

10. The findings of a recent study provide an interesting example of the process of natural selection—certain light coloured animals living in environments that have been \_\_\_\_\_ soot and other forms of pollution, eventually take on a darker colouration.
- (A) painted with  
(B) coloured with  
(C) satiated with  
(D) exposed to  
(E) whetted in
11. The sound produced by the newly formed band was so \_\_\_\_\_ that even its least experienced members were abashed.
- (A) sonorous  
(B) caustic  
(C) mellifluous  
(D) indigent  
(E) strident
12. According to one point of view, it is not correct to use compassion as a \_\_\_\_\_ (i) \_\_\_\_\_ principle because it is based on the assumption that just because an animal is like me in certain aspects, it will be like me in some other aspects as well. \_\_\_\_\_ (ii) \_\_\_\_\_, this is an erroneous means of proving identity because it ignores the various historical, cultural and other references that might have crept in. Just because an animal looks like us does not mean that it is actually like us.
- (A) a universal.....moreover  
(B) a discriminating.....furthermore  
(C) a subjective.....surprisingly  
(D) a contentious.....nonetheless  
(E) a differentiating.....however
13. Despite her age and exposure to the world, she has an asinine and \_\_\_\_\_ personality.  
**(Real NMAT Question)**
- (A) mature  
(B) immature  
(C) cultivated  
(D) materialistic  
(E) sophisticated
14. Successful government programs have helped \_\_\_\_\_ poverty and inequality in the last couple of decades, but compared with rich countries, Latin American countries \_\_\_\_\_ fall short.
- (A) elevate; understandably  
(B) alleviate; still  
(C) erase; no longer  
(D) invigorate; do not  
(E) castigate; will not
15. Modern science has proved that the fundamental traits of every individual are \_\_\_\_\_ stamped in the shape of his body, head, face and hands—an X-ray by which one can read the characteristics of any person on sight.
- (A) superficially  
(B) equivocally  
(C) indelibly  
(D) fleetingly  
(E) inevitably
16. A brave and highly decorated officer, the Army General is \_\_\_\_\_ as a brilliant strategist and a reform-minded leader who is unforgiving of corruption, as reflected in the hard line he adopted against \_\_\_\_\_ officers in the recent housing scam.
- (A) propounded; scrupulous  
(B) reviled; crooked  
(C) revered; erring  
(D) regarded as; pious  
(E) looked down upon; corrupt
17. \_\_\_\_\_ his essays and lectures, Emerson left behind some poetry in which are \_\_\_\_\_ those thoughts which were to him too deep to be expressed as prose.
- (A) as a result of; precluded  
(B) for; contained  
(C) despite; missing  
(D) besides; embodied  
(E) in addition to; removed

18. I read the other day some verses written by an eminent painter, which were \_\_\_\_\_ and not \_\_\_\_\_.  
 (A) prosaic; stolid  
 (B) iconoclastic; conventional  
 (C) verbose; prolix  
 (D) sacrilegious; blasphemous  
 (E) droll; humorous
19. It would not be surprising to hear that in sheer \_\_\_\_\_ for a vote-bank, the members of parliament \_\_\_\_\_ started a brawl. **(Real NMAT Question)**  
 (A) shyly; boldly  
 (B) anxiety; calmness  
 (C) reticence; timorously  
 (D) hopelessness; timidly  
 (E) desperation; brazenly
20. Many items of clothing are worn purely for traditional or ceremonial purposes—because the occasion demands it. For example, the tie has no \_\_\_\_\_ function that anyone can explain, yet most people working in a corporate environment would rarely be seen without one.  
 (A) accepted  
 (B) rational  
 (C) critical  
 (D) illogical  
 (E) peculiar
21. In a rather surprising incident, Mr. Lal, the noted politician, who is otherwise known for his tact and \_\_\_\_\_, came up with such an \_\_\_\_\_ and unsatisfactory reply to the question. **(Real NMAT Question)**  
 (A) guile; imperative  
 (B) stoicism; underhand  
 (C) perception; indiscreet  
 (D) sensitivity; insuperable  
 (E) intelligence; unconditional
22. To some people, life is hard, cruel and \_\_\_\_\_. These set of people see life as a punishment and, therefore, \_\_\_\_\_ themselves to fate, believing all is finished.  
 (A) sanguine; give up  
 (B) unforgiving; torpor  
 (C) salutary; sacrifice  
 (D) remorseless; fight  
 (E) unsparing; resign
23. When a terrier comes into the room, you instinctively draw away \_\_\_\_\_ you want to be jumped at and greeted effusively, but you make no such movement to protect yourself from a St. Bernard because you read, on sight, the \_\_\_\_\_ natures of these two from their external appearance.  
 (A) because; stoic  
 (B) nonetheless; tractable  
 (C) for; incomprehensible  
 (D) unless; disparate  
 (E) as; enthusiastic
24. Changes to the world economy have had \_\_\_\_\_ effect on the nationalities of private-jet buyers. A market that as recently as 15 years ago was \_\_\_\_\_ by American clients now reflects the rise of smaller nations.  
 (A) an obviating; yielded  
 (B) a considerable; eschewed  
 (C) a deleterious; led  
 (D) an ameliorating; loved  
 (E) a telling; dominated

## 5 Cloze Test

Questions 1–16 below consist of short passages from which several words have been deleted and replaced with blanks. For each blank, select from the choices the word that best fits that blank, taking into account the overall meaning conveyed by the passage.

Questions 1–4 consist of a short passage from which several words have been deleted and replaced with blanks. For each blank, select from the choices, the word that best fits that blank, taking into account the overall meaning conveyed by the passage.

Lady Hawkins had earned the \_\_\_\_\_ (1) \_\_\_\_\_ of her extensive family by marrying below her station and moving into her poor husband's \_\_\_\_\_ (2) \_\_\_\_\_, shabby house. Her father refused to talk to her and her brothers had \_\_\_\_\_ (3) \_\_\_\_\_ all roads to reconciliation by publicly declaring that they never had a sister. The family was in shock that a genteel lady, strictly brought up in \_\_\_\_\_ (4) \_\_\_\_\_ to rules that governed society, would actually take such a step.

1. (A) ire  
(B) veneration  
(C) love  
(D) sympathy  
(E) guilt
2. (A) uncouth  
(B) malignant  
(C) lavish  
(D) ornate  
(E) dilapidated
3. (A) reverberated  
(B) decimated  
(C) obfuscated  
(D) revealed  
(E) ridiculed
4. (A) denouncement  
(B) dissonance  
(C) absence  
(D) deference  
(E) scorn

The dilapidated building at the end of Andover road had always been a point of dispute in the neighbourhood. In an \_\_\_\_\_ (5) \_\_\_\_\_ to the modern buildings around it, it's \_\_\_\_\_ (6) \_\_\_\_\_ design was an absolute eyesore. Professor Raymond had, however, managed to secure approval for the building as a heritage site, making it \_\_\_\_\_ (7) \_\_\_\_\_ to demolish. He was oblivious to the \_\_\_\_\_ (8) \_\_\_\_\_ of the neighbours, as he had lived in this building for 30 years and was very comfortable here.

5. (A) endorsement  
(B) approbation  
(C) idiosyncrasy  
(D) antithesis  
(E) ordeal
6. (A) aesthetic  
(B) obsolete  
(C) revolutionary  
(D) maverick  
(E) grandiloquent
7. (A) ludicrous  
(B) dangerous  
(C) impossible  
(D) burdensome  
(E) paramount
8. (A) passion  
(B) antipathy  
(C) support  
(D) hegemony  
(E) peroration

Jane Sequeira was born in 1856. Her father was so great a \_\_\_\_\_ (9) \_\_\_\_\_, that the place of her birth is uncertain. However, she generally assumed it to be Scotland, since she had spent the first five years of her life there. While still very young, Jane \_\_\_\_\_ (10) \_\_\_\_\_ traces of exquisite sensibility, soundness of understanding, and decision of character, but owing to the domineering and conservative nature of her father, she could not develop these personality traits any further. When she turned eighteen, Jane became acquainted with Miss Beatrix Potter, who, \_\_\_\_\_ (11) \_\_\_\_\_ refined taste and considerable knowledge of the fine arts, seems to have given the first impulse to the formation of Jane's character. Buoyed by her new-found independence, Jane left her parents' house, and \_\_\_\_\_ (12) \_\_\_\_\_ with a local community worker—Mrs. Dinshaw—for four years, when she had to return to her parental home to tend to her ailing mother.

9. (A) lunatic  
(B) historian  
(C) wanderer  
(D) merchant  
(E) warrior
10. (A) repudiated  
(B) proclaimed  
(C) created  
(D) surfaced  
(E) exhibited
11. (A) possessing  
(B) surrendering  
(C) utilising  
(D) rejecting  
(E) affording
12. (A) struggled  
(B) adhered  
(C) loathed  
(D) resided  
(E) labored

Robert's grandfather's \_\_\_\_\_ (13) \_\_\_\_\_ for reading was also reflected in his writing. His everlasting wish was to have his book published. Having filled out the \_\_\_\_\_ (14) \_\_\_\_\_ forms at the publishing house, Robert proceeded to meet the chief editor. A \_\_\_\_\_ (15) \_\_\_\_\_ young man, Robert was, however, painfully aware of the curious glances his worn-out suit was getting. His \_\_\_\_\_ (16) \_\_\_\_\_ vision threw up motions of suppressed smiles and hastily averted eyes. He, however, ignored the unwarranted attention.

13. (A) disdain  
(B) penchant  
(C) abhorrence  
(D) insouciance  
(E) ignorance
14. (A) unnecessary  
(B) cumbersome  
(C) verbose  
(D) relevant  
(E) tortuous

15. (A) presentable  
(B) shabbily dressed  
(C) tawdry  
(D) poor  
(E) scholarly
16. (A) fading  
(B) humongous  
(C) peripheral  
(D) variegated  
(E) scornful

Drugs to control cholesterol have been used for more than a decade. For a long time, doctors prescribed them very \_\_\_\_\_ (17) \_\_\_\_\_ because of early studies that raised questions about potentially \_\_\_\_\_ (18) \_\_\_\_\_ effects. However, due to recent \_\_\_\_\_ (19) \_\_\_\_\_ research, evidence that is \_\_\_\_\_ (20) \_\_\_\_\_ has supported the efficacy and use of these drugs. (Real NMAT Question)

17. (A) leisurely  
(B) cautiously  
(C) inadvertently  
(D) clandestinely  
(E) surreptitiously
18. (A) intense  
(B) placebo  
(C) dangerous  
(D) innocuous  
(E) speculative
19. (A) uncommitted  
(B) embellished  
(C) prejudiced  
(D) fabricated  
(E) promising
20. (A) imperceptible  
(B) hypothetical  
(C) inadvertent  
(D) persuasive  
(E) axiomatic



Intuition is considered akin to perception and memory but it is \_\_\_\_\_ (21) \_\_\_\_\_ viewed with more scepticism than the other two. There should be enough evidence and supporting facts to reach a \_\_\_\_\_ (22) \_\_\_\_\_ conclusion, else it would just qualify as an opinion. The argument that our opinions are only the result of our conscious machinations is a little \_\_\_\_\_ (23) \_\_\_\_\_; many a child's outburst of opinion is based on impressions cast on the unconscious mind. Dream analysts have now developed new ways of \_\_\_\_\_ (24) \_\_\_\_\_ information that could have been locked into the recesses of the subconscious mind. (*Real NMAT Question*)

21. (A) often  
(B) surely  
(C) closely  
(D) clearly  
(E) myopically
22. (A) logical  
(B) intense  
(C) serious  
(D) complex  
(E) systematic
23. (A) creative  
(B) unnerving  
(C) theoretical  
(D) suggestive  
(E) exaggerated
24. (A) storing  
(B) hacking  
(C) stealing  
(D) gathering  
(E) furnishing

## 6 Identify the Error

Questions 1–20 each has a sentence with four underlined words or phrases. Identify the one underlined word or phrase that must be changed in order to make the sentence correct. Mark E for no error.

1. In order to lose weight, you need to both eat in small quantities as well as exercise regularly.  
 (A) to lose  
 (B) need to  
 (C) as well as  
 (D) regularly  
 (E) No error
2. The artist's most impressive works have been produced at his home in New York, he moved there from his native place, India.  
 (A) artist's most impressive  
 (B) have been produced  
 (C) New York, he moved there  
 (D) native India  
 (E) No error
3. Cristina starting the test later than the rest of the students but was still able to complete it in the allotted time.  
 (A) starting the  
 (B) later than  
 (C) but  
 (D) it  
 (E) No error
4. Most Indian students pursue their MBAs immediately after completing college, while a few working for two or three years before seeking admission.  
 (A) pursue their MBAs  
 (B) completing college, while  
 (C) working for  
 (D) before seeking  
 (E) No error
5. After graduating from college, his parents gave him a brand new car, ten thousand rupees and a trip around the state. (Real NMAT Question)  
 (A) After graduating  
 (B) his parents gave him  
 (C) a brand new car  
 (D) around the state  
 (E) No error
6. Priscilla and I was punished by the teacher for not completing the assignment on time.  
 (A) Priscilla and I  
 (B) was punished  
 (C) not completing  
 (D) on time  
 (E) No error
7. The client that is coming for a meeting tomorrow is one of our oldest and most important clients.  
 (A) that is  
 (B) for  
 (C) is one of  
 (D) most important clients  
 (E) No error
8. The pupils loved playing cricket, gorging on fruits in the orchard and to bathe in the adjoining pond.  
 (Real NMAT Question)  
 (A) loved  
 (B) gorging  
 (C) to bathe  
 (D) adjoining  
 (E) No error
9. Hoping to receive a permanent position, the intern put in 16 hours of work everyday.  
 (A) Hoping  
 (B) a permanent position  
 (C) put in  
 (D) everyday  
 (E) No error
10. Although Rajesh studied hard for the test, yet he could only manage a second division.  
 (A) studied  
 (B) for the test  
 (C) yet  
 (D) only manage  
 (E) No error
11. While some may doubt the feasibility of the proposal, it is based on empirical evidence, unlike policies.

- that result from either fanciful suppositions or from political whims.
- (A) doubt the feasibility  
(B) it is based  
(C) unlike policies that  
(D) from political whims  
(E) No error
12. The large and barren expanse of the Sahara desert is at once forbiddingly empty, climatically harsh, and the beauty of it is haunting.
- (A) large and barren  
(B) are at once  
(C) climatically harsh  
(D) the beauty of them is haunting  
(E) No error
13. When Amir met Tiara for the first time, he was thinking that she was very pretty.  
(Real NMAT Question)
- (A) met  
(B) for  
(C) was thinking  
(D) was  
(E) No error
14. Jerry knows it is futile to convince his wife to buy the beach house because she is neither fond of swimming nor does she like to surf.
- (A) Jerry knows  
(B) to convince his wife  
(C) because  
(D) nor does she like to surf  
(E) No error
15. Always I try to be punctual. Yesterday, I fell into a ditch while on my way to school.  
(Real NMAT Question)
- (A) Always  
(B) fell  
(C) a ditch  
(D) while on my way  
(E) No error
16. The dormant volcano started spewing lava last year and it has been erupting sporadically ever since.
- (A) started spewing  
(B) and  
(C) has been erupting  
(D) ever since  
(E) No error
17. Sharks are a type of fish with a full cartilaginous skeleton and a highly streamline body.  
(Real NMAT Question)
- (A) are  
(B) fish  
(C) full  
(D) streamline  
(E) No error
18. In this store, we sell items sourced from not only Asia but also from the Central and Latin Americas.
- (A) items sourced  
(B) not only Asia  
(C) from  
(D) Central and Latin Americas  
(E) No error
19. The latest spacecraft sent by ISRO attempts to take high resolution photographs of the surface of Neptune, understand the characteristics of the atmosphere of the planet, and to search for evidence of life. (Real NMAT Question)
- (A) spacecraft sent by  
(B) attempts to take  
(C) of the surface of  
(D) to search for  
(E) No error
20. The items served in my restaurant are far more diverse and delicious than your restaurant.
- (A) served in  
(B) are far more  
(C) and delicious  
(D) your restaurant  
(E) No error

21. According to leading economists across the world, rising inflation is one of the factors that seem to indicate that an economy might be headed for a recession.
- (A) across the world
  - (B) rising inflation is
  - (C) that seem to indicate
  - (D) might be headed
  - (E) No error
22. In this museum, there is a large number of artefacts from every historical period, going as far back as the time of the ancient Greek.
- (A) there is
  - (B) of artefacts from
  - (C) period, going
  - (D) as
  - (E) No error
23. When enquired as to which course he would prefer to take, Laksh replied that either of the two courses was fine with him.
- (A) as to which
  - (B) would prefer
  - (C) replied that
  - (D) was fine
  - (E) No error
24. The Netherlands have proved their mettle in this year's Euro Cup as a progressive football playing nation. (Real NMAT Question)
- (A) have
  - (B) mettle
  - (C) year's
  - (D) football playing nation
  - (E) No error

## 7 Choose the Correct Preposition

In questions 1–15, choose the set of prepositions whose meaning and sequence best fits the three given sentences.

1. i. Krishna said that he would arrive \_\_\_\_\_ 2 and 3 pm.  
 ii. In the newly constructed shopping mall the shops stay open \_\_\_\_\_ 11 am to 11 pm.  
 iii. The formalities are all over and the rocket is ready for launch \_\_\_\_\_ 30 minutes.  
 (a) at  
 (b) from  
 (c) on  
 (d) in  
 (e) between  
 (f) for  
 (A) bde  
 (B) cdb  
 (C) ebd  
 (D) eca  
 (E) dbc
2. i. We walked \_\_\_\_\_ the river bank until we found our clothes.  
 ii. Jaggu was accused \_\_\_\_\_ cheating in the exam.  
 iii. The MD apologised \_\_\_\_\_ the CEOs poor behaviour.  
 (a) in  
 (b) along  
 (c) of  
 (d) to  
 (e) for  
 (f) by  
 (A) bce  
 (B) cbe  
 (C) ecd  
 (D) dce  
 (E) fce
3. i. The manager told his staff that he would arrive \_\_\_\_\_ 3:00 and 4:00 pm.  
 ii. The army will be ready to attack \_\_\_\_\_ 40 minutes.  
 iii. Varun cancelled the movie plan, saying he wanted to stay \_\_\_\_\_ home instead.

- (a) until  
 (b) in  
 (c) for  
 (d) at  
 (e) within  
 (f) between

- (A) bfd  
 (B) fdb  
 (C) ace  
 (D) fbd  
 (E) fec

### 4. (Real NMAT Question)

- i. After injuring the old man, the criminals abandoned him to his fate and escaped \_\_\_\_\_ his money.
- ii. No one \_\_\_\_\_ the committee is in favour of selecting him as chairman for the second consecutive term.
- iii. Have some guards stand \_\_\_\_\_ in case we get into trouble and need help.  
 (a) on  
 (b) along  
 (c) with  
 (d) in  
 (e) from  
 (f) by  
 (A) aeb  
 (B) bde  
 (C) bec  
 (D) caf  
 (E) ede

5. i. The shops in the central shopping district are open \_\_\_\_\_ Monday to Saturday.  
 ii. I watched the football match \_\_\_\_\_ the television last night.  
 iii. I will reach the office \_\_\_\_\_ 10:00 am.  
 (a) by  
 (b) through

- (c) from
- (d) in
- (e) for
- (f) on

- (A) cfa
- (B) bde
- (C) fca
- (D) caf
- (E) ebf

#### 6. (Real NMAT Question)

- i. 26<sup>th</sup> January is celebrated \_\_\_\_\_ great enthusiasm and festivity.
- ii. The colourful parade starts \_\_\_\_\_ Vijay Chowk and ends at the Red Fort.
- iii. Everybody walked \_\_\_\_\_ the route to view the march past.
  - (a) amid
  - (b) with
  - (c) from
  - (d) upon
  - (e) over
  - (f) along

- (A) afe
- (B) bcf
- (C) fab
- (D) cda
- (E) bfd

#### 7. (Real NMAT Question)

- i. What seemed like difficult and hectic lectures turned out to be useful and instrumental lessons \_\_\_\_\_ effective personal development.
- ii. Even though my teacher was a patient lady, she was quite strict \_\_\_\_\_ students who were irresponsible and undisciplined.
- iii. While Jack scored average marks in most of his subject tests, he was, \_\_\_\_\_ a long way, ahead of his peers when it came to general knowledge.
  - (a) against
  - (b) towards
  - (c) of
  - (d) along
  - (e) with
  - (f) by

- (A) bac
- (B) bef
- (C) dce
- (D) ecb
- (E) fda

8. i. The actor responded to the director's demand \_\_\_\_\_ throwing a tantrum.
- ii. Since the CEO was not in, the MD had to fill in \_\_\_\_\_ him at the Board meeting.
- iii. What are the primary requirements \_\_\_\_\_ this approach?

- (a) of
- (b) for
- (c) in
- (d) from
- (e) by
- (f) to

- (A) abe
- (B) bea
- (C) fba
- (D) cba
- (E) eba

#### 9. (Real NMAT Question)

- i. Parents these days are extremely motivated to send their children \_\_\_\_\_ physical training in order to combat obesity.
- ii. Education plays a vital role \_\_\_\_\_ the upliftment of the masses.
- iii. Children should get the space \_\_\_\_\_ criticise and change their inherited worlds.
  - (a) in
  - (b) to
  - (c) for
  - (d) into
  - (e) unto
  - (f) through

- (A) bce
- (B) cab
- (C) adc
- (D) cba
- (E) dcb

10. i. It has been raining in Mumbai \_\_\_\_\_ Wednesday morning.  
 ii. Kamal was fined by the traffic police for driving \_\_\_\_\_ 120 kmph.  
 iii. People often listen to music \_\_\_\_\_ their way to the office.  
 (a) for  
 (b) from  
 (c) since  
 (d) in  
 (e) at  
 (f) on
- (A) bee  
 (B) bea  
 (C) dcf  
 (D) cef  
 (E) ecf
11. i. The administration's new proposals have been met \_\_\_\_\_ a lot of opposition from the citizens of the town.  
 ii. The children are so excited to eat out that they are unable to choose between a pizza \_\_\_\_\_ a burger  
 iii. When asked to come for the party, Ramesh declined saying that he had decided to stay \_\_\_\_\_ home and study instead  
 (a) with  
 (b) or  
 (c) and  
 (d) for  
 (e) in  
 (f) at
- (A) acf  
 (B) cbe  
 (C) abf  
 (D) dbe  
 (E) abe
12. (Real NMAT Question)
- i. I was \_\_\_\_\_ the house and this is what I saw.  
 ii. He was pouring water \_\_\_\_\_ the glass when it fell from his hand.  
 iii. She took her shoes \_\_\_\_\_ and walked barefoot on the grass.  
 (a) in  
 (b) at

- (c) into  
 (d) onto  
 (e) off  
 (f) of
- (A) bca  
 (B) aae  
 (C) bdf  
 (D) cdf  
 (E) ace

13. i. The work fell \_\_\_\_\_ schedule because of the sudden departure of the Managing Director.  
 ii. I am tired \_\_\_\_\_ doing nothing all day but wasting my time.  
 iii. The young man got himself a dog \_\_\_\_\_ company.  
 (a) of  
 (b) behind  
 (c) to  
 (d) in  
 (e) for  
 (f) from
- (A) feb  
 (B) cfa  
 (C) abe  
 (D) eba  
 (E) bae
14. i. The life guard told the swimmers to watch \_\_\_\_\_ for sharks.  
 ii. On meeting Tanveer after a gap of five years, Anil enquires what he was up \_\_\_\_\_  
 iii. My boss is extremely rude and I do not get \_\_\_\_\_ with him at all.  
 (a) with  
 (b) out  
 (c) from  
 (d) to  
 (e) by  
 (f) along
- (A) edf  
 (B) bdf  
 (C) bae  
 (D) fed  
 (E) dfe

## 15. (Real NMAT Question)

- i. The department has always faced criticism \_\_\_\_\_ its poor services.
  - ii. Anxious parents lined up for hours together \_\_\_\_\_ the school waiting for their children.
  - iii. Taking cognizance \_\_\_\_\_ the fire, the department has marked a probe into the incident.
- (a) of
  - (b) for
  - (c) from
  - (d) aside
  - (e) outside
  - (f) besides

- (A) bcf
- (B) acf
- (C) dfe
- (D) bea
- (E) bad

## 16. (Real NMAT Question)

- i. Threatening \_\_\_\_\_ sue the authorities, she said that she was seeking legal opinion.
  - ii. After years \_\_\_\_\_ struggle, she earned favourable conditions at her workplace.
  - iii. Health care programmes aimed \_\_\_\_\_ providing treatment to the under-privileged children.
- (a) at
  - (b) of
  - (c) to
  - (d) into
  - (e) from
  - (f) around

- (A) cba
- (B) ade
- (C) cbe
- (D) bda
- (E) acb

17. i. My father works \_\_\_\_\_ a security officer in a hotel.

- ii. Kavita told her friend that she was not good \_\_\_\_\_ cooking.

- iii. Since the doctor is not in, the nurse is taking care \_\_\_\_\_ us at the moment.

- (a) at
- (b) with
- (c) for
- (d) as
- (e) of
- (f) by

- (A) dea
- (B) ade
- (C) dae
- (D) bfa
- (E) cbf

## 18. (Real NMAT Question)

- i. The room was adequate \_\_\_\_\_ our needs.

- ii. The speaker deviated \_\_\_\_\_ the topic.

- iii. The youth embarked \_\_\_\_\_ an adventure.

- (a) on
- (b) by
- (c) at
- (d) for
- (e) from
- (f) in

- (A) bea
- (B) cab
- (C) dea
- (D) dfa
- (E) fbd



19. (Real NMAT Question)

- i. The mayor could not be entrusted \_\_\_\_\_ handling sensitive religious issues in the wake of his inability to take action to stop the recent communal tension in the city.
- ii. It is even suspected that he might have colluded \_\_\_\_\_ the communal leaders of some political organisations representing the majority community to incite violence against the minority community.
- iii. The media too has charged that police officials abstained from taking action against rioters \_\_\_\_\_ his behest.

- (a) at
- (b) on
- (c) upon
- (d) with
- (e) of
- (f) for

- (A) dfb
- (B) dda
- (C) ddc
- (D) fda
- (E) efa

## 8 Reading Comprehension

Each of the reading comprehension questions is based on the content of a passage. After reading the passage, answer all questions pertaining to it on the basis of what is stated or implied in the passage. For each question, select the best answer from the given choices.

### Passage 1

If we look at the world around us and all that is happening therein, we would be tempted to believe that either nature has made great difference between men and women or that past civilizations have been extremely partial towards men. In every sphere of life, women are routinely discriminated against and treated as inferior to men. While men are spoken about for their intellect and leadership, women are only spoken about for their beauty. What makes matters worse is that it is women themselves who are partly to be blamed for this state of affairs because they pay too much attention to their external appearance and too little attention to what lies within their heads. The myriad books authored by men, which portray women as beguiling mistresses rather than as devoted wives, have only fuelled this perception. Thanks to the specious impression created by these books, women (with the exception of a select few) become intoxicated by all the attention being showered on them and end up believing that their purpose in life is to win the love and approval of men, when they should actually be devoting their lives to more noble pursuits in order to earn the respect of the society.

While I don't intend to vigorously fight the people who view women as inferior to them, I definitely want to make my stand on the issue clear. There is no denying the fact that nature has made women inferior to men, at least physically. Men have always been the protectors whereas women have been simply expected to yield, in no small measure due to them being physical weaker. This is the way nature made things and I am fine with it. What I have a problem with is that men have taken this physical inferiority much further and ordained women as the overall weaker sex who are merely objects of allure. This is simply not correct as women can often be mentally much stronger than men. Women also have a much greater capacity for bearing pain, as any woman who has been through labour will testify. I only request my fellow women to not get taken in by all the attention men shower on them for their beauty and try to rise above such superficial concerns and make their mark on this world.

1. The primary purpose of the passage is to:
  - (A) question male writers for not focusing on the issues of women in their literary works.
  - (B) reconcile two contrasting opinions about the role of women in our society.
  - (C) describe how parents and schools are making women weak by encouraging them to focus only on superficial beauty.
  - (D) argue that women are meant to and should be encouraged to serve a higher purpose in society than just look attractive.
  - (E) propose a restructuring of the roles of women in society by shifting the focus from attractiveness to more noble ambitions.
2. According to the passage, who among the following is responsible for the current state of women in the society?
  - i. The parents of women
  - ii. The women themselves
  - iii. Books by some male writers
  - (A) i only
  - (B) ii only
  - (C) ii and iii only
  - (D) i and iii only
  - (E) i, ii and iii only
3. What is the meaning of 'specious', as used in the passage?
  - (A) large
  - (B) deceptive
  - (C) accommodating
  - (D) unconvincing
  - (E) malicious

4. Which of the following assertions would the author of the passage most likely agree with?

- i. Men are physically superior to women.
- ii. Women enjoy the attention lavished on them by men.
- iii. Women should rebel against the injustices meted out to them by men.

- (A) i only
- (B) iii only
- (C) ii and iii only
- (D) i and ii only
- (E) i, ii and iii only

## Passage 2

In these modern times of fast food lunches, take-away dinners and ready-to-eat breakfasts, we often reminisce about the dishes that our mothers made when we were young. The aromas and flavours of those dishes are still fresh in our minds, though several years have passed since we last had these. Is it the flavour that actually makes us remember these dishes? Or is it that these dishes are connected to other pleasant memories of those times and of our younger selves, which have left an indelible impression on our minds?

If we think about how our mother's garden used to be, there was nothing remarkable about it, at least at first glance. What did stand out was that everything—flowers, fruits and vegetables—was neatly laid out and pleasing to the eye. Widely contrasting fruits and vegetables such as strawberries and cucumber, poppies and potatoes, turnips and tomatoes grew in perfect harmony in mother's garden.

One group of plants that one particularly remembers among this eclectic mix is the "sweet" herbs placed just outside the kitchen. These are items that we never see on the table and that never play leading roles in the dramatic act that is mother's cooking. Nonetheless, these are absolutely essential ingredients of mother's food, just like members of the cast who play small but important roles and without whom the act would lose a lot of its colour and charm. It is these performances that one remembers long after one has forgotten the names of the leading cast members. The herbs in mother's garden are no different.

1. The author compares herbs in mother's garden with members of 'the cast' primarily in order to:
  - (A) describe the supporting role played by these herbs in preparing a dish.
  - (B) identify a similarity between these herbs and other fruits and vegetables.
  - (C) analyse the relationship between herbs and cooking.
  - (D) explain how these herbs play a vital role in providing flavour to a dish.
  - (E) point out the key differentiating ingredients in mother's dishes.
2. According to the passage, which of the following could be a reason we are attracted towards the dishes made by our mothers?
  - (A) They were made using ingredients that are not available today.
  - (B) They satisfied our hunger much better than modern dishes do.
  - (C) They did not involve the use of artificial flavours.
  - (D) They serve as reminders of our younger selves.
  - (E) They were made from home grown vegetables.

3. According to the passage, which of the following was a unique feature of mother's garden?
  - (A) The availability of rare herbs and vegetables.
  - (B) The use of sweet herbs.
  - (C) The addition of mother's love.
  - (D) The effort that went into preparing the dishes.
  - (E) The neat and organised layout.
4. From the information in the passage, which of the following is not true of the herbs discussed in the last paragraph of the passage?
  - (A) They tasted sweet.
  - (B) Their memory lingered long after the food was eaten.
  - (C) They were usually not the main ingredient of a dish.
  - (D) They added flavour to a dish.
  - (E) They were not laid out on the dining table.

### Passage 3

A clutch of new studies in the field of the psychology of emotion offer opportunities for humans to have better control over their emotions. Unfortunately, some other research has proven conclusively that certain emotions that are triggered spontaneously, most notable among them being anger, are often accompanied by the release of various types of chemicals and hormones. These chemicals and hormones, interestingly, help to further sustain the emotional outburst. To take an example, anger causes the release of adrenaline, and this adrenaline further helps to sustain, and even magnify, that aroused state of anger. To make matters worse, the rate of dissipation of this adrenaline is not within the control of the conscious human mind. Hence, when such emotions get triggered, they tend to circumvent our conscious mind, a fact that has several vital implications for emotional impulse control.

The solution then is to somehow be able to avoid setting off such impulses that are beyond the control of our conscious mind, something that is easier said than done. One way of doing so is to get a better understanding of how we perceive different events around us. The idea is to view everything with an objective mindset and avoid the 'jumping to conclusions' syndrome, which can trigger these unwanted impulses. To illustrate, it is possible for two people to view the same event but reach entirely different conclusions about its connotation. Let's say if we see a group of people pointing in our direction and laughing, many of us will misconstrue such an act, thinking that those people are laughing at us and become irritated or angry. Such a reaction could then trigger the adrenaline-fuelled anger, and we could even end up getting into a fight with those people. However, a smarter, and less impulsive, approach could be to simply view the event for what it is—a group of people pointing at something and laughing. For all we know, they could be pointing at something behind us. Such people will not jump to conclusions; rather, they will wait for more clarity on the actions of those people before coming up with a reaction. Remember that even though we cannot control the action of those people, we can always control our reaction to their actions, by addressing them calmly or even simply ignoring them.

1. According to the passage, in which of the following hypothetical cases would a person be able to consciously control his or her emotions?
  - i. If a person becomes angry at the slightest of provocations but no hormone is released.
  - ii. If a person consumes a recently developed drug that greatly increases the rate of dissipation of hormones in the human body.

- iii. If a person is taking a medication that prevents the release of adrenaline in the human body.
  - (A) ii and iii only
  - (B) i and ii only
  - (C) iii only
  - (D) ii only
  - (E) i, ii and iii

2. According to the passage, a rational person differs from a highly impulsive person in that:
  - (A) a rational person's body produces a controllable amount of hormones.
  - (B) a rational person is able to better control his judgment of events.
  - (C) a rational person does not let his hormones affect his emotions.
  - (D) a rational person does not allow emotions to bypass his conscious mind.
  - (E) a rational person has no less a tendency to jump to conclusions.
3. What is the meaning of the word 'misconstrue' as used in the passage (paragraph two)?
  - (A) mislead
  - (B) misdemeanor
  - (C) misguide
  - (D) misinterpret
  - (E) misrepresent
4. Why does the author use the term 'unfortunately' in the second sentence of the passage?
  - (A) To underscore the inherent sorrow that a person who is unable to contain his emotions, faces.
  - (B) To provide a contrast with the previous sentence by stating that in some cases a person may not be able to voluntarily control his emotions in the first place.
  - (C) To assert that a person not being able to control his emotions is not the desired state of affairs.
  - (D) To conclude that all the efforts of researchers have gone in vain because there is actually a connection between hormones and emotions.
  - (E) To arrive at a conclusion about the relationship between hormones and emotions later in the passage.

### Passage 4 (Real NMAT Passage and Questions)

A heuristic or 'rule of thumb' is a simple rule that can be applied specifically to many situations. Whereas an algorithm is very specific and will always lead to a solution, a heuristic is an educated guess based on prior experiences and always leads to a solution. It helps narrow down the possible solutions for a problem. For example, if a student is typing a paper in a word-processing programme and wants to know about formatting, he would simply click on the 'Format' tool bar instead of reading the entire manual for word processing. Thus the student won't have to read much to get an answer. Using the help feature or clicking on the appropriate tool bar will also work for similar problems.

Will using heuristics always work, like algorithms? As compared to algorithms, using a heuristic is faster in many cases; but unlike algorithms, it will not always lead to the correct solution. What you gain in speed is sometimes lost in accuracy. For example, one kind of heuristic (representative heuristic) for categorising objects simply assumes that anything that shares characteristics with the members of a particular category is also a member of that category. This proves to be quite a handy tool while classifying plants but doesn't apply well to people. Are all people with dark skin from Africa? Does everyone with red hair also have a bad temper? Thus, the representative heuristic can be used or misused to create and sustain stereotypes.

A useful heuristic that works much of the time is to work backward from the goal. For example, if you want to know the shortest way to get to the new bookstore in town, you already know the goal, i.e., finding the bookstore. There are probably several ways to get there from your house, and some shorter than others. Assuming you know the address, the best way to determine the shortest route is to look up the location of the store on the city map and then trace a route back to where you live.

While writing a term paper, starting at the end won't help. Sometimes it's better to break a goal down into sub-goals, so that as each sub-goal is achieved, the final solution is closer. Writing a term paper, for example, can be difficult if not broken down into steps: choose a topic, research the topic, organise content, etc. Other examples of heuristics include making diagrams to help organise the information concerning the problem or testing the possible solutions and eliminating the undesired ones.

Another kind of heuristic is means-end analysis, in which a person determines the difference between the current situation and the goal and then tries to reduce that difference by various means (methods). For example, Rhea wanted a certain kind of invitation for her wedding, but buying it ready-made was very expensive. She ordered one sample of the invitation and examined it carefully. It had a pocket inside that held the response cards for people to send back to Rhea, a decorative seashell and a fancy ribbon on it. Her goal was to make 200 of these invitations by

hand. Her sub-goals were to find the paper, take the invitation carefully apart to see how to put one together, buy decorative material and assemble the invitations. Thus, an impossible task became easy by breaking it down into smaller sub-goals.

- What is the central idea of the passage?
  - Using heuristics has positive and negative results.
  - Qualitative differences exist among kinds of heuristics.
  - There is a difference between the use of algorithms and heuristics.
  - There are various kinds of heuristics with differences among them.
  - What is heuristics, its types, usefulness, appropriateness and judicious application.
- According to the passage, one of the major drawbacks of heuristics is that:
  - they cannot provide a reliable solution.
  - diagrams have to be drawn to find solutions to problems.
  - they are of no use when it comes to classification of plants.
  - they have to be chosen according to the situation and often lack accuracy and reliability.
  - they are a golden rule of problem-solving, but they do not prove useful in all situations.
- According to the author, what can be concluded from the passage?
  - Heuristics may or may not be situation-specific.
  - The use of heuristics provides a sure fire solution to any given problem.
  - Algorithms and heuristics do not differ much in terms of reliability and speed.
  - Heuristics help in ruling out other possibilities and thus provide a direct solution.
  - Appropriate use and choice of heuristics in a particular situation can help solve problems.
- According to the passage, the author most likely agrees with all of the following statements EXCEPT:
  - any kind of heuristics will fit any situation.
  - heuristics are faster than using an algorithm.
  - breaking a goal into sub-goals makes it easy.
  - heuristics may involve making diagrams to arrive at the final goal.
  - representative heuristics can be used or misused for creating stereotypes.

### Passage 5

Once a charitable foundation bestows a grant of money to a chosen recipient, or "beneficiary," the foundation's main defence against misuse/waste of its grant is the individual contractual agreement between foundation and beneficiary. These contracts tend to be idiosyncratic, varying with the specific purposes of the foundation and the grant; thus, they have not been the focus of much academic study. However, scholars have identified informal non-contractual control mechanisms by which foundations guard against misuse of their investment. Such mechanisms arise at three points: in the initial screening of projects, in the decision of how much funding to allocate, and in the contract between the foundation and the beneficiary.

Needless to say, a foundation's power over its beneficiaries' activities is greatest before it has committed money to them. Foundations can best protect against unsatisfactory use of their grants by awarding grants only to beneficiaries which intend to use the money for projects which the foundation encourages. Screening may be done in two ways. First, foundations can issue public statements on types of programs they will—or will not—fund. This will prevent mistaken misuse by recipients, though not fraudulent abuse. Foundations may issue absolute (negative) prohibitions; for example, a clause that no money will be given for personal charity or religious education. Alternately, they may affirmatively announce types of projects that they will fund.

Second, foundations can take a proactive role, by working with promising applicants to propose new projects or define the goals/parameters of existing ones. A foundation exercises considerable power through its grasp of the purse strings and the manner in which it doles out its grant. Most fundamentally, a foundation can specify what type of expenses it will, or will not, reimburse. Furthermore, foundations can grant themselves more discretion, and retain more of their bargaining power with beneficiaries, by disbursing only part of the total projected cost at regular intervals. This allows them to monitor a project to ensure it has not strayed from the desired parameters, and it also encourages beneficiaries to meet deadlines and disclose results.

Once the foundation has disbursed some or all of its funding and the beneficiary's project is underway, the foundation may want to continue monitoring progress to prevent misuse of funds or unwanted deviations from the originally planned project. This supervision can be accomplished through several methods. The foundation can specify in its agreement with the beneficiary that its grant is a conditional grant, contingent on specified uses. An alternate approach is for the foundation to appoint monitors to work with the beneficiary throughout the project. This is a common practice for venture capital "foundations" in monitoring the start-up companies which are the beneficiaries of their seed capital.

1. What is the primary purpose of the passage?
  - (A) To describe why it is imperative for charitable foundations to keep a track of the activities the beneficiaries they have funded.
  - (B) To argue for the creation of more standards contracts between charitable foundations and their beneficiaries.
  - (C) To explain and support the proactive role certain charitable organisations play in the activities of their beneficiaries.
  - (D) To discuss the different ways in which charitable foundations can control the misuse of their funds by the beneficiaries.
  - (E) To provide an explanation for the seemingly overbearing behaviour of charitable organisations towards their beneficiaries.
2. According to the passage, each of the following is a method used by charitable foundations to control use of their funds EXCEPT:
  - (A) making the grant of funds dependent on the fulfillment of certain obligations and deliverables on the part of the beneficiary
  - (B) explicitly detailing the types of expenditure that they will reimburse or not reimburse.
  - (C) prohibiting certain types of beneficiaries from applying for their funds.

- (D) acting as mentors to their beneficiaries and guiding them in making appropriate use of the funds.
  - (E) giving out the total amount of the grant in a staggered manner.
3. According to the various criteria mentioned in the passage, which of the following entities will most probably not be funded by a charitable organisation?
- i. An entity that requires the entire amount of the grant to be paid upfront.
  - ii. An entity that plans to undertake an activity prohibited by the charitable organisation.
  - iii. An entity that refuses to follow the subsequent instructions of the charitable organisation arising over the course of its operations.
- (A) ii only
  - (B) iii only
  - (C) ii and iii only
  - (D) i, ii and iii
  - (E) i and ii only
4. What is the meaning of the term 'discretion' as used in the 3<sup>rd</sup> paragraph of the passage?
- (A) secrecy
  - (B) responsibility
  - (C) authority
  - (D) credibility
  - (E) gullibility



## Passage 6

The biggest house of cards, the longest tongue and, of course, the tallest man—these are among the thousands of records logged in the famous *Guinness Book of Records*. Created in 1955 after a debate concerning Europe's fastest game bird, what began as a marketing tool sold to pub landlords to promote Guinness, an Irish drink, became the bestselling copyright title of all time (a category that excludes books such as the Bible and the Koran). In time, the book would sell 120 million copies in over 100 countries—quite a leap from its humble beginnings.

In its early years, the book set its sights on satisfying man's innate curiosity about the natural world around him. Its two principal fact finders, twins Norris and Ross McWhirter, scoured the globe to collect empirical facts. It was their task to find and document aspects of life that can be sensed or observed, things that can be quantified or measured—but not just any things. They were only interested in superlatives: the biggest and the best.

In its latest incarnation, the book has found a new home on the Internet. No longer restricted to the confines of physical paper, the *Guinness World Records* website contains seemingly innumerable facts concerning such topics as the most powerful combustion engine or the world's longest train. What is striking, however, is that such facts are found sharing a page with the record of the heaviest train to be pulled with a beard. While there is no denying that each of these facts has its own individual allure, the latter represents a significant deviation from the education-oriented facts of earlier editions. Perhaps, there is useful knowledge to be gleaned regarding the tensile strength of a beard, but this seems to cater to an audience more interested in seeking entertainment than education.

Originating as a simple bar book, the *Guinness Book of Records* has evolved over decades to provide insight into the full spectrum of modern life. And although one may be more likely now to learn about the widest human mouth than the highest number of casualties in a single battle of the Civil War, the *Guinness World Records* website offers a telling glimpse into the future of fact finding and record recording.

1. What is the main purpose of the author in writing the passage?
  - (A) To discuss the origins of the *Guinness Book* and its evolution over the years.
  - (B) To criticise the fact that the *Guinness Book*, in its current form, stresses more on entertainment than on education.
  - (C) To explain the origin of the *Guinness Book*.

- (D) To analyse what makes the *Guinness Book* the largest selling book in the world.
  - (E) To discuss how the *Guinness Book* originated and to advocate against the commercialisation of the book in its current form.

2. Which of the following is mentioned in the passage as a record contained in the *Guinness Book*?
  - (A) The world's largest combustion engine.
  - (B) The world's longest train.
  - (C) The world's heaviest train.
  - (D) The world's widest mouth.
  - (E) The world's strongest beard.
3. According to the author, how is the current version of the *Guinness Book* different from its older versions in terms of content?
  - (A) The book is now available on the internet.
  - (B) The book now contains entertainment-oriented facts along with educational ones.
  - (C) The book now offers insight into the full spectrum of life.
  - (D) The focus of the book has shifted from providing education to providing entertainment.
  - (E) The *Guinness Book* offers a telling glimpse into the future of fact finding and record recording.

## Passage 7

There is no doubt that Machiavelli's *The Prince* was very different from other political texts of the Classical era in that it veered more towards the shrewd and pragmatic modern form of politics. However, there is sufficient proof that Machiavelli was not the creator of this political system. In fact this system, called 'realpolitik' or politics without principles, was actually in practice long before Machiavelli's time. Machiavelli just made this system more popular and mainstream.

One example of the use of realpolitik before Machiavelli's time is of the evil Spanish imperial advisor Ortega Sorolla, who openly stated that the ruling emperor was to be supported at all costs and who imprisoned or executed anyone who posed a challenge to the emperor. In fact, several historians believe that Sorolla actually got several exceptionally talented men secretly assassinated as he was afraid that one day they would pose a threat to the emperor's throne.

Supporters of Machiavelli believe that power was a tangible entity, which could be reflected or ascertained by the size of the army that a ruler commanded. The ruler's objective was to instill in the minds of his followers the fact that they should always think about war and how they would be victorious in one, as neglecting this could often lead to losing one's kingdom. For Machiavelli, the truly powerful kingdoms were those that could use their money and clout to command large armies and use these armies to subjugate other kingdoms. These conquered kingdoms then deservedly became objects of ridicule and contempt.

Machiavelli's lack of focus on the quality of governance within a state is clear from the fact that it is only as late as in chapter XII that he talks about the importance of having good laws within a state. This too seems to be an afterthought since Machiavelli pays no particular attention to the quality of these laws. He simply makes open ended statements and never really goes down to describing in details what attributes make up a 'good' law.

According to Machiavelli, whatever actions a prince undertakes are with the single minded intention of gaining a

good reputation in history books, even if that reputation is earned after the death of the prince. Machiavelli narrates the example of Agathocles, who rose from poverty to become the king of Syracuse by killing all those who stood in his path. This made Agathocles truly powerful in Machiavelli's eyes. However, Machiavelli still doesn't consider Agathocles' achievements as perfect because, by committing the atrocities that he did commit, Agathocles only gained power but no glory. Thus, he failed to become part of the clique of famous men who had earned glory in Machiavelli's eyes.

1. Which of the following can be inferred from the passage about most political theory in the Classical era?
  - (A) It was not favoured by several important men of that time.
  - (B) It was considered mild and less aggressive in comparison to other political theories of that time.
  - (C) It was rooted more in practicality than in principles.
  - (D) It was eventually abandoned in favour of realpolitik.
  - (E) At least some of its tenets were not rooted in practicality.
2. Why does the author mention Chapter XII in the passage?
  - (A) To explain that Machiavelli never actually described what were the characteristics of a good law.
  - (B) To show that Machiavelli considered arms superior to laws.
  - (C) To highlight the low level of importance Machiavelli assigned to the presence of good laws in a state.
  - (D) To prove that good governance never formed a part of Machiavelli's teachings.
  - (E) To explain how Machiavelli was only concerned with the presence of laws, not with their quality.

3. Which of the following assertions would Machiavelli most likely agree with?
- i. There is nothing wrong in showing contempt towards those who have lost in battle.
  - ii. The king should perform only two functions—fight good wars and make good laws.
  - iii. A ruler who committed atrocities would still gain glory as long as he won wars.
- (A) i only
  - (B) iii only
  - (C) i and iii only
  - (D) ii and iii only
  - (E) i and ii only
4. Which of the following is a point of similarity between Sorolla and Machiavelli?
- (A) Both of them believed in the supreme position of the emperor.
  - (B) Both of them believed that victory in a war was paramount, no matter at what cost it came.
  - (C) Both of them believed that maintaining a strong and able army was more important than making good laws.
  - (D) Both of them believed that it was acceptable to go to any lengths in the single minded pursuit of one's goal.
  - (E) Both of them were a creation of the initial monopoly of the Classical political theory.

### Passage 8

It is not uncommon for close synonyms to be understood to share the same meaning. The difference between words like 'hard' and 'difficult', for example, goes tragically unnoticed. One may employ one or the other with complete indifference, postulating no discrepancy between them. In general, this is well and good; most people lack the scrupulous pedanticness to quibble over such trifles. Nevertheless, for those of us with ample compulsiveness (and time), it is of significant value to comprehend such nuances.

Take for example the following sentences: (a) The test was hard. (b) The test was difficult. Is the difference between these synonyms readily apparent? Is there a noticeable difference between them at all? Indeed, these questions are valid and warrant answer. For, what would be the point to having multiple words with the exact same meaning? No, and that would be superfluous with the English language being far too economical. While many close synonyms share similar, if not the same, dictionary definitions, the feeling, or mood, they convey is utterly singular. Although a dictionary can provide information about word meanings, pronunciations, etymologies, inflected forms, derived forms and so on, it cannot communicate how it feels to use a word.

Granted, the notion that close synonyms can be used interchangeably is prevalent among English speakers. And alas, the dictionary—the text purported to be responsible for clarifying such issues—is of little assistance. In the end, it is left to us, the speakers of the language—those actively responsible for maintaining its sustenance and generation—to understand how these words make us feel and what mood we are inclined to attach to them. Using the examples and insights described earlier, one may come to recognise these subtle, yet crucial, differences.

1. The author of the passage is most likely to agree with which of the following?
  - (A) Two words can never be complete synonyms.
  - (B) The dictionary does not contain all the meanings of a word.
  - (C) The English language is inherently superfluous.
  - (D) Two words can never be used interchangeably.
  - (E) It is pedantic to quibble over the difference in meaning between two close synonyms.
2. What is the primary purpose of the passage?
  - (A) To explain the limitations of the dictionary.
  - (B) To highlight the importance of users of the English language in conveying the feelings and moods attached to a word.

- (C) To prove why two words can never be exact synonyms.
  - (D) To discuss the importance of subtle feelings and moods attached to words having similar meanings.
  - (E) To criticise those who believe that synonyms can always be used interchangeably.
3. According to the passage, each of the following is true of a dictionary, EXCEPT:
    - (A) It can help pronounce words correctly.
    - (B) It provides information about the origin of words.
    - (C) It does not communicate the feeling or mood attached to a word.
    - (D) It provides all the meanings of a word.
    - (E) It helps choose which word to use from amongst closely related synonyms.

**Passage 9 (Real NMAT Passage and Questions)**

Tycho Brahe, a famous sixteenth century astronomer, is well-known for his contributions to modernising astronomy. He designed, built and continuously calibrated astronomical instruments with periodic checks on their accuracy. Tycho transformed astronomical instrumentation and observational practices in astronomy.

One of the reasons why Tycho went on to revolutionise astronomy was that he understood the importance of accuracy in astronomy and his pursuit of it. Where earlier astronomers were content in observing the positions of the planets and the Moon only at certain important points in their paths, Tycho, along with his assistants, observed these heavenly bodies throughout their orbits. Consequently, Tycho discovered orbital anomalies, which were previously unknown. These anomalies would later help Kepler, Tycho's assistant, to discover that planets moved in elliptical orbits.

Tycho discovered a new star, Cassiopeia, in 1572. The publication of his observations in his book *De Nova Stella* in 1573 catapulted him to the class of great astronomers. Additionally, Tycho discovered a comet in 1577. On measuring the distance or parallax of the comet, Tycho was able to prove that the comet was further away than the Moon. This refuted the Aristotelian belief that comets were 'gases burning in the atmosphere'. His observations were instrumental in instituting the fact that heavenly bodies like the stars and comets were above the Moon and thus, heavens were not immutable, contrary to Aristotle's beliefs. This directly questioned Aristotelian division between heavenly and earthly regions.

Furthermore, if comets were believed to exist in heaven, then they would have needed to move through heaven. The prevalent belief at the time was that planets were seated on spherical shells that fitted tightly around each other. Tycho illustrated the implausibility of this arrangement as he showed comets to move through these spheres. This led to fading out of the existence of celestial spheres between 1575 and 1625.

However, Tycho could not ignore Aristotelian physics, which was founded on the 'absolute' notion of place—heavy bodies 'fall' to their 'natural place', and, based on this, the Earth, was the centre of the universe. Had this not been the case, the basic foundations and principles of physics at the time, would have been severely challenged. Tycho, to some measure, also supported the heliocentric planetary arrangement proposed in 1543 by another great astronomer, Nicholas Copernicus. Instead of adopting either of the two theories, Tycho devised his own theory using the best of both theories. According to Aristotelian physics, Tycho retained the Earth as the centre of the universe. The Moon and Sun revolved around the Earth, whereas Mercury, Venus, Mars, Jupiter and Saturn revolved around the Sun. The shell of the fixed stars was centred on the

Earth. However, he put the circular path of the comet he discovered in 1577 between Venus and Mars.

This Tychonic world system became popular early in the seventeenth century. This system provided a middle ground between the Ptolemaic models and Copernican models. Thus, Tycho's quality of the observations themselves was central to the development of modern astronomy.

1. What is the central idea of this passage?

- (A) The Tychonic system was a trailblazer that is in use even today.
- (B) Tycho's extensive use of Aristotelian physics endorsed his belief in Aristotle.
- (C) Tycho's discoveries paved the way for the development of modern astronomy.
- (D) Celestial spheres are still in existence today and dictate the course of astronomy.
- (E) Tycho's discoveries were instrumental in understanding how paths of planets and comets crossed.

2. Which of the following, if true, would weaken the argument presented in the text?

- (A) Aristotelian physics played a part in Tycho's discoveries.
- (B) Astronomy was an active discipline in the sixteenth century.
- (C) Tycho was able to garner only limited fame discovering the star, Cassiopeia.
- (D) The Ptolemaic system was more accepted than the rejected Copernican model.
- (E) Tycho accidentally discovered that the spheres on which planets rested had gaps.

3. The author mentions all of the following EXCEPT:

- (A) Kepler's discovery of elliptical planetary orbits.
- (B) Tycho's other assistants and their achievements.
- (C) Tycho modernised astronomical instrumentation.
- (D) Tycho's work endorsed the Aristotelian definition of comets.
- (E) Tycho's discovery of the shell of fixed stars centred on the Earth.

4. Based on the passage, what can be concluded about the author's tone when writing about Tycho Brahe?

- (A) It is cynical.
- (B) It is mocking.
- (C) It is supportive.
- (D) It is ambivalent.
- (E) It is pessimistic.

# Passage 10

Criminal identification by means of fingerprints is one of the most potent factors in obtaining the apprehension of fugitives who might otherwise escape arrest and continue their criminal activities indefinitely. This type of identification also makes possible an accurate determination of the number of previous arrests and convictions, which of course results in the imposition of more equitable sentences by the judiciary, in as much as the individual who repeatedly violates the law finds it impossible to pose successfully as a first or minor offender. In addition, this system of identification enables the prosecutor to present his case in the light of the offender's previous record. It also provides the probation officers, parole board and the governor with definite information upon which to base their judgement in dealing with criminals in their jurisdictions.

From earliest times, fingerprinting, because of its peculiar adaptability to the field, has been associated in the lay mind with criminal identification to the detriment of the other useful phases of the science. However, the Civil File of the Identification Division of the Federal Bureau of Investigation contains three times as many fingerprints as the Criminal File. These civil fingerprints are an invaluable aid in identifying amnesia victims, missing persons and unknown deceased. In the latter category, the victims of major disasters may be quickly and positively identified if their fingerprints are on file, thus providing a humanitarian benefit not usually associated with fingerprint records.

The use of fingerprints for identification purposes is based upon distinctive ridge outlines which appear on the bulbs on the inside of the end joints of the fingers and thumbs. These ridges have definite contours and appear in several general pattern types, each with general and specific variations of the pattern, dependent on the shape and relationship of the ridges. The outlines of the ridges appear most clearly when inked impressions are taken upon paper, so that the ridges are black against a white background. This result is achieved by the ink adhering to the friction ridges. Impressions may be made with blood, dirt, grease or any other foreign matter present on the ridges, or the saline substance emitted by the glands through the ducts or pores which constitute their outlets. The background or medium may be paper, glass, porcelain, wood, cloth, wax, putty, silverware or any smooth, non-porous material.

1. In the second paragraph, what is the function of the sentence *However, the Civil File of the Identification Division of the Federal Bureau of Investigation contains three times as many fingerprints as the Criminal File?*

- (A) To explain how fingerprints can have humanitarian uses such as helping to identify victims of natural disasters.
  - (B) To illustrate the importance of fingerprints in different fields.
  - (C) To state that the Civil File of the FBI has more fingerprints than does the Criminal File.
  - (D) To point out that fingerprints have another more important use that is different from the one that is commonly perceived by the people.
  - (E) To conclude that fingerprints play an important secondary role in the civil society as well.
2. From the information in the passage, which of the following can be most properly inferred?
  - (A) Fingerprint impressions obtained with the use of ink are better than those obtained using substances such as dirt or grease.
  - (B) Fingerprints have many more uses in criminal investigation than they do in civil cases.
  - (C) The matching of fingerprints is the most foolproof way of apprehending hardened criminals.
  - (D) The use of fingerprint records helps the justice system deliver more equitable sentences.
  - (E) The presence of saline substances on the ridges of fingertips makes it difficult to get a definite fingerprint impression.
3. What is the main purpose of the author in writing the passage?
  - (A) To explain the need for collecting fingerprints.
  - (B) To advocate the study of civil fingerprints to assist the judiciary.
  - (C) To analyse the implications of maintaining a database of fingerprints.
  - (D) To praise the advocates for bringing to justice the repeat offenders.
  - (E) To discuss the history, usefulness and mode of collecting fingerprints.
4. According to the information in the passage, the impressions of the fingerprints can be obtained from all of the following, EXCEPT:
  - (A) Saline substances
  - (B) Ink
  - (C) Grease
  - (D) Wax
  - (E) Perspiration

## Passage 11

The Cyclopes, according to mythology, were a race of bad-tempered and rather stupid one-eyed giants. Not, perhaps, a great portent for a new generation of robots. But Andrew Davison, a computer scientist at Imperial College, London, thinks one eye is enough for a robot, provided its brain can think fast enough. For a robot to work autonomously, it has to understand its environment. Stereoscopic vision, integrating the images from two 'eyes' looking at the same thing from different angles, is one approach to achieve this, but it involves a lot of complicated computer processing. The preferred method these days, therefore, is Simultaneous Localisation and Mapping (SLAM), which uses sensors such as laser-based range finders that 'see' by bouncing beams of light off their surroundings and timing the return.

Dr. Davison, however, wants to replace the range finders, which are expensive and fiddly, with a digital camera, which is small, cheap and well-understood. With this in mind, he is developing ways to use a single, moving video camera to create continually updated 3D maps that can guide even the most hyperactive of robots on its explorations. His technique involves collecting and integrating images taken from different angles as the camera goes on its travels. The trick is to manage to do this in real time, at frame rates of 100–1,000 per second.

The shape of the world pops out easily from laser data because it represents a direct contour map of the surrounding area. A camera captures this geometry indirectly, and so needs more (and smarter) computation if it is to generate something good enough for a self-directing robot. The answer is a form of triangulation, tracking features, such as points and edges, from one frame to the next. With enough measurements of the same set of features from different viewpoints, it is possible, if you have a fast enough computer programme, to estimate their positions and thus, by inference, the location of the moving camera.

However, developing such a programme is no mean feat. In the milliseconds between successive frames, relevant information from each fresh image must be extracted and fused with the current map to produce an updated version. The higher the frame rate, the less time there is to do this work.

1. According to the passage, integration of images from two 'eyes' is termed as:
  - (A) computer processing
  - (B) SLAM
  - (C) stereoscopic vision
  - (D) sensors
  - (E) autonomous angles
2. From the passage, each of these can be inferred, EXCEPT:
  - (A) digital cameras are cheaper than range finders
  - (B) range finders allow robots to see with one eye
  - (C) the Cyclops is a mythical creature.
  - (D) to work independently, a robot must be able to understand its surroundings.
  - (E) range finders have the ability to create 3D maps
3. According to the passage, why is a digital camera preferred over range finders?
  - (A) Development of images is better.
  - (B) It is small and economical and well-understood
  - (C) It is more fiddly.
  - (D) It can continuously update images.
  - (E) It can upload 3D maps.
4. What is the main purpose of the author in writing this passage?
  - (A) To explain why SLAM is better than stereoscopic vision.
  - (B) To advocate the use of digital cameras in place of range finders.
  - (C) To analyse emerging techniques in computer vision.
  - (D) To praise a scientist for his groundbreaking work.
  - (E) To discuss techniques for use in self-guided robots.

## Passage 12 (Real NMAT Passage and Questions)

Social networking sites allow users to connect to each other—the users have to first create their personal information profiles before they can invite their friends or colleagues to access the profiles and have instant message exchanges. These personal profiles can comprise of information, photographs and audio/video files.

In an age of increasingly sophisticated technology, large volumes of online personal content pose a big threat to users' privacy. With the flooding of digital cameras and smart phones that have advanced applications, uploading of personal data, photos and videos on the Web has become child's play. Privacy has thus become a concern with many as multimedia applications are capable of making public so much personal information without consent or approval.

These concerns are genuine as we look into the penetration of the Internet in different aspects of our lives. According to Forrester Research, 75% of Internet surfers use social networks. The official site of Facebook claims that the network added more than 210 crore subscribers in just one year, which is almost the combined population of UK (63 crore), France (65 crore) and Germany (82 crore). The collection of 8 billion photographs by the image-hosting site Flickr dwarfs the treasure of 137 million artifacts, works of art and specimens in the world's largest museum, Smithsonian. It may sound bizarre but it is true that every minute of the day, 40200 tweets are sent, 50 hours of video are uploaded to YouTube, 50,000 apps are downloaded from the App Store, and around 3 lakh dollars are spent by consumers on online shopping.

Many users post highly personal details of their lives on social networks. It includes their real names and addresses, family details, contact numbers, availability, likes and dislikes, hobbies and relationships.

Users are naïve if they believe that their postings on the Internet are private and safe between them and the recipients. In reality, once information is posted to social networks, the users lose their ownership. It will not be offline again and will remain there for millions of eyes. If this is hard to believe, try and Google yourself. Chances are that you will get the shock of your life to see details you had never, ever wanted to go public.

'If you feel like someone is watching you, you're right. If you're worried about this, you have plenty of company'. (Bob Sullivan, senior MSNBC writer)

The availability of personal information online is an invitation for identity theft. Casual online sharing of videos and photos has often made youngsters vulnerable. The companies which operate social networks are not there for social reforms; they are there for money. Most of them collect user data both to personalise their services and to sell to marketers. Many employers often begin their hiring process with an online search. The web is host to candid information about prospective employees.

The solution to users' online privacy concerns is not imminent as long as in cyberspace, there are no rules or regulations to protect individuals' privacy rights and users don't become more judicious in their online postings.

1. What is the central idea of the passage?
  - (A) Posting private details on social networks has the most serious negative implications for identity theft.
  - (B) Online social networking has become the lifeline of modern times.
  - (C) Personal information should not be posted on social networks.
  - (D) Users of social networks are prone to serious privacy attacks.
  - (E) Facebook is the first choice of the users of social networks.
2. The author most likely agrees with all of the following statements EXCEPT:
  - (A) cyberspace is becoming a primary source of information for employers looking for prospective candidates.
  - (B) most users in cyberspace are yet to cultivate some trust on online shopping.
  - (C) in a single year, around 210 crore new subscribers joined Facebook.
  - (D) profit is the main motive of most social networking operators.
  - (E) crores of tweets are sent in the cyberspace in a single day.



3. According to the author, which of the following is true in the context of the impacts of social networks?
- (A) Governments in developed countries are considering comprehensive cyber laws to protect users' privacy.
  - (B) Barring a few reputed social networks, most others collect user-data to personalise their services.
  - (C) Professional users of social networks learn to keep their online postings away from public view.
  - (D) Sharing personal photographs online does not pose any serious privacy threat to the users.
  - (E) One-fourth of Internet surfers still keep away from using social networks.
4. Which of the following is not implied in the passage?
- (A) If you are in cyberspace, your privacy concerns are genuine.
  - (B) It is not possible yet to retract the data once uploaded to cyberspace.
  - (C) Social network operators sell users' private information to companies on profit.
  - (D) Cyber laws are not stringent enough to provide protection against users' identity theft.
  - (E) Increasing sophistication of technology has played a role in imposing some control on threats to privacy.

### Passage 13

A science fiction writer coined the useful term 'cyberspace' in 1982, but the territory in question, the electronic frontier, is about 130 years old. Cyberspace is the 'place' where a telephone conversation appears to occur. Not inside your actual phone, but the plastic device on your desk. Not inside the other person's phone, but in some other city. The place between the phones. The indefinite place out there, where the two of you, two human beings, actually meet and communicate. Although it is not exactly 'real', 'cyberspace' is a genuine place. Things happen there that have very genuine consequences. This 'place' is not 'real', but it is serious, it is earnest. Tens of thousands of people have dedicated their lives to it, to the public service of public communication by wire and electronics.

People have worked on this 'frontier' for generations now. Some people became rich and famous from their efforts, while some just played in it, as hobbyists. Others soberly pondered it, and wrote about it, and regulated it, and negotiated over it in international forums and sued one another about it, in gigantic, epic court battles that lasted for years. And, almost since the beginning, some people have committed crimes in this place.

But in the past 20 years, this electrical 'space', which was once thin and dark and one-dimensional—little more than a narrow speaking tube, stretching from phone to phone—has flung itself open like a gigantic jack-in-the-box. Light has flooded upon it, the eerie light of the glowing computer screen. This dark electric netherworld has become a vast flowering electronic landscape. Since the 1960s, the world of the telephone has crossbred itself with computers and television, and though there is still no substance to cyberspace, nothing you can handle, it has a strange kind of physicality now. It makes good sense today to talk of cyberspace as a place all its own because people live in it now. Not just a few people, not just a few technicians and eccentrics, but thousands of people, quite normal people—and not just for a little while either, but for hours straight, over weeks, and months and years. Cyberspace today is a 'Net', a 'Matrix', international in scope and growing swiftly and steadily. It is growing in size, wealth and political importance.

1. Which of the following cannot be inferred from the information in the passage?
  - (A) The term 'cyberspace' has been in use for over a century.
  - (B) People have used cyberspace to make profits.
  - (C) Cyberspace is not really a physical place.
  - (D) Regulations have been made governing cyberspace.
  - (E) Some people have used cyberspace to commit crimes.

2. What is the main purpose of the third paragraph in the passage?
  - (A) To underline the importance of cyberspace.
  - (B) To delineate the underlying threat of cyberspace to normal man.
  - (C) To explain how cyberspace means different things to different people.
  - (D) To discuss the changes that have taken place in cyberspace in the last two decades.
  - (E) To discuss the political and social impact of cyberspace.
3. Which of the following would the author of the passage not agree with?
  - (A) Cyberspace includes email, social media websites, e-commerce and so on.
  - (B) It would be incorrect to consider cyberspace an individual entity.
  - (C) Books have been written about cyberspace.
  - (D) Modern cyberspace is an amalgam of telephones and computers.
  - (E) Thousands of people are involved with the cyberspace in some way or the other.

### Passage 14

The old civilisation of India was a concrete unity of many-sided developments in art, architecture, literature, religion, morals and science, so far as it was understood in those days. But the most important achievement of Indian thought was philosophy. It was regarded as the goal of all the highest practical and theoretical activities, and it indicated the point of unity amidst all the apparent diversities which the complex growth of culture over a vast area inhabited by different peoples produced.

It is not in the history of foreign invasions, in the rise of independent kingdoms at different times, in the empires of this or that great monarch that the unity of India is to be sought. It is essentially one of spiritual aspirations and obedience to the law of the spirit, which were regarded as superior to everything else, and it has outlived all the political changes through which India passed.

The Greeks, the Huns, the Scythians, the Pathans and the Mughals, who occupied the land and controlled the political machinery, never ruled the minds of the people. These political events were like hurricanes or the changes of season, mere phenomena of a natural or physical order which never affected the spiritual integrity of Hindu culture. If, after a passivity of some centuries, India is again going to become creative, it is mainly on account of this fundamental unity of her progress and civilisation and not for anything that she may borrow from other countries.

1. Each of the following can be inferred from the information in the passage EXCEPT:
  - (A) India has faced various foreign invasions in the past.
  - (B) Philosophy was held in high regard in older civilisations.
  - (C) There has been complacency in Indian philosophical thought.
  - (D) Unity of India was affected due to its vast geographical area.
  - (E) Political invasion has not had any impact on India's spiritual integrity.

2. The author predicts that India:
  - (A) will rule the world sometime in the future.
  - (B) will resurface as a philosophical power.
  - (C) will actively contribute to the progress of mankind.
  - (D) will contribute again to spirituality.
  - (E) will progress due to its political machinery.
3. What is the primary purpose of the author in writing the passage?
  - (A) To compare Indian philosophy with that of other civilisations.
  - (B) To analyse the connection between Indian civilisation and philosophy.
  - (C) To trace the impact of political invasions on Indian philosophy.
  - (D) To discuss the points of unity in India.
  - (E) To discuss the rise of spiritual aspirations in India.
4. From the passage, which of the following cannot be concluded about Indian philosophy?
  - (A) It has a goal of bringing together different people.
  - (B) It brought together practical and theoretical activities.
  - (C) It was immune to political upheavals.
  - (D) Spirituality is an important part of it.
  - (E) It is not subjugated by time.

### Passage 15 (Real NMAT Passage and Questions)

In Chennai, the annual turtle-walk is an event that environmental enthusiasts have begun to look forward to year after year. Walkers interact with each other to create and increase awareness about the endangered species. Environmentalists have managed to garner enough interest in the walk—so much so, that every year, there are new volunteers joining the group trying to help the Olive turtles, classified under the endangered species in Schedule I of the Wildlife Act, survive.

One of the only two species of the genus *Lepidochelys* that is known for arribadas or mass synchronised nesting, the Olive Ridley Turtles nest in the beaches of Chennai between the months of December and April. Measuring about two and a half feet in length, these are the smallest of the sea turtles and are restricted to the Pacific and Indian Oceans.

The walkers, environmental enthusiasts from all walks of life, walk along the beach that extends from Neelankarai to Besant Nagar in Chennai. Each night from about 11 PM to 4 AM, they walk along the beaches looking for turtle eggs buried in the sand, digging them out to relocate them and move them to safer places. Actually, the eggs are moved to a hatchery. Adult turtles are known to come ashore, lay eggs in the sand and return to sea. They never return to their eggs or babies. The turtle eggs have a gestation period of 45 to 50 days after which they hatch.

From the description provided by the walkers, these walks seem to be a memorable experience. Volunteers are trained to identify and follow turtle trails. They have described the nests to be pot-shaped having a narrow neck above a broader chamber base. During the walks, the walkers have often said that they even come across turtles laying eggs. Many of them have also witnessed little baby turtles hatching from the eggs. The babies are completely black when newly born and wet.

The first such walk that took place in Chennai was in the year 1988 and was undertaken by the voluntary organisation Students Sea Turtle Conservation Network or SSTCN. Turtle walks notwithstanding, year 2012 reportedly saw a drop in the count of turtles. Thankfully, year 2013 found 213 nests, the highest since the previous best of 1991 when 203 turtle nests were found, giving hope and reason to believe that despite rampant fishing activities and rapid urbanisation along the coasts resulting in the endangering of these warm and tropical-water sea turtles, the turtles are surviving.

1. How would you describe the tone of the passage?

- (A) Sad
- (B) Cheerful
- (C) Informal
- (D) Descriptive
- (E) Non-committal

2. The passage does not mention that the Olive turtles:

- (A) are protected under the Wildlife Act.
- (B) are being threatened by coastal urbanisation.
- (C) do not bother about their babies after they lay eggs.
- (D) hatch baby turtles that are black when newly born and wet.
- (E) on the Chennai beaches have been consistently increasing.

3. The passage:

- (A) describes arribadas as mass-synchronised nesting.
- (B) does not mention the gestation period of the Olive turtles.
- (C) mentions Olive turtles to be the only species known for arribadas.
- (D) does not mention anything about volunteers witnessing the actual hatching process.
- (E) mentions that the highest number of turtle nests were found during the walks of Year 1991.

4. Which of the following is not mentioned in the passage?

- (A) The walkers dig out buried turtle eggs from the sand and relocate them to safer places at night.
- (B) The Olive Ridley Turtles' nests are pot-shaped having a narrow neck above a broader chamber base.
- (C) There is reason to believe that the Olive Ridley Turtles are surviving despite the threats to them from rapid urbanisation.
- (D) The about two and a half feet long Olive Ridley Turtles nest in the beaches of Chennai between the months of December and April.
- (E) Environmental enthusiasts look forward to the bi-annual Chennai turtle-walk so as to be able to discuss ways of protecting the endangered species.

## 9 Parajumbles

Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.

1. (a) Atal Bihari Vajpayee too was a fan of mangoes and his childhood friend Anna Kiwalkar would send him two crates every week during the season.
  - (b) The exchange is termed as 'mango diplomacy' and is seen as winning over foes.
  - (c) Former PM Indira Gandhi's love for mangoes was well known within her circle and close friends visiting her would always get mangoes for her.
  - (d) This exchange is based on the intense national pride across South Asia about whose mangoes are the most delicious.
  - (e) Prime Ministers of India and Pakistan frequently send the best varieties of mangoes from their respective countries to each other.
- (A) caedb  
(B) bdeac  
(C) deacb  
(D) baedc  
(E) cdeab

### 2. (Real NMAT Question)

- (a) According to this method, an injection of cyanide would keep the horns safe, but would be fatal to anyone who consumes a part of the horn.
  - (b) Although it is illegal to procure these items, the poaching of these exquisite animals continues to this day, with the number of rhino deaths hitting a shameful peak in 2010.
  - (c) It is hoped that this would effectively render the black market for rhino parts redundant.
  - (d) A South African rhino reserve owner has come up with an ingenious suggestion: poison the horn.
  - (e) The Asian market for alternative medicine is infamous for its use of animal parts, notable among them being the fin of a shark and the horn of a rhino.
- (A) dbace  
(B) dcabe  
(C) edacb  
(D) ebdac  
(E) ebdca

3. (a) The app was initially designed for transferring money over the mobile since carrying cash was risky.
  - (b) Vodafone brought m-pesa to India and launched it as a pilot in Rajasthan, rolling it out fully in 2013.
  - (c) But it soon changed into a financial service and became a big hit.
  - (d) M-pesa, a mobile based application, started in Kenya in 2007 as a CSR pilot project by Safaricom, a Vodafone subsidiary.
- (A) bcad  
(B) dacb  
(C) dcab  
(D) bcda  
(E) dbca

4. (a) Only then can any virus make use of its single talent, which is to take control of a host's cellular machinery and use it to churn out thousands of copies of itself.
  - (b) In this way, one infected cell soon becomes billions.
  - (c) These viruses then move from one cell to the next, transforming each new host into a factory that makes even more virus.
  - (d) A virus is nothing more than a few strands of genetic material wrapped in a package of protein—a parasite, unable to function on its own.
  - (e) In order to survive, it must find a cell to infect.
- (A) dceab  
(B) bcead  
(C) deacb  
(D) decab  
(E) bdcea
5. (a) If this is so, then public spaces function like a stage in the same way that our own homes and living rooms do.

- (b) Several scholars over the years have drawn analogies between life and theatre.
- (c) For instance, the eminent sociologist Erving Goffman suggested that life is a series of performances, in which we are all continually managing the impression we give other people.
- (d) Architecture, landscaping, the dimensions of the stage, and the other actors around us all offer cues about how we should perform and how we should treat one another.
- (A) acdb  
(B) badc  
(C) cdeb  
(D) edcb  
(E) bcad
6. (a) The reality is that studies do not confirm such phases.
- (b) There is an almost universally accepted perception that we must pass through certain phases in our processing of grief.
- (c) Grief reactions never follow the simple stages often described in textbooks and other media in the public domain.
- (d) This idea is based on the fact that well-known theorists many decades back wrote about these phases.
- (e) Since then, this has been repeated so many times and in so many contexts and in so many media outlets that it has been taken as a fact.
- (A) cbade  
(B) bdeac  
(C) cdbae  
(D) bedac  
(E) bdeca
7. (a) The world's chief interest is, and has always been, in successful men such as him.
- (b) The popular interest in Henry Ford is not difficult to explain.
- (c) It does not matter whether their success has come in the right way or the wrong way.
- (d) It does not matter much in what field their achievement lies, so long as they have achieved.
- (e) Pirates, outlaws, prize fighters, soldiers, statesmen, writers, painters, movie stars—we are interested in all of them as long as they have been successful.
- (A) abced  
(B) abecd  
(C) badec  
(D) bdace  
(E) bacde
8. (a) Self-driving cars promise to create a new kind of leisure, offering passengers additional time for reading books, writing emails, knitting, taking a catnap, and any number of other diversions.
- (b) People who are unable to drive themselves could experience a new kind of independence.
- (c) Moreover, self-driving cars could re-contextualise land use on a massive scale.
- (d) In this imagined mobility utopia, drone trucks would haul packages across the country and no human would have to circle a city block in search of a parking spot.
- (A) adbc  
(B) acbd  
(C) cbad  
(D) abcd  
(E) bacd
9. (a) The reward system was about pleasure and somehow learning what yields it, and little more.
- (b) If you had opened a textbook on brain rewards in the late 1980s, it would have told you that the dopamine and opioids that swished and flickered around the reward pathway were the blissful brain chemicals responsible for pleasure.
- (c) It wasn't until the early 1990s, after rigorous research, that he felt bold enough to go public with his new thesis.
- (d) So when Berridge, a dedicated young scientist who was more David than Goliath, stumbled upon evidence in 1986 that dopamine did not produce pleasure, but in fact desire, he kept quiet.
- (A) acbd  
(B) badc  
(C) bdac  
(D) cbad  
(E) cdba

**10. (Real NMAT Question)**

- (a) However, at least for now, it seems that the nations whose people eat shark fins have the upper hand.
- (b) In fact, in China, due to it being so expensive, serving the shark-fin soup is seen as a mark of respect.
- (c) By some estimates, some 73 million sharks are killed each year by finning fishermen leading to widespread demand from wildlife experts to protect sharks.
- (d) No wonder then, that despite shark meat itself not being so popular, sharks are hunted for their fins, leading to the infamous 'shark-finning at sea', where sharks are de-finned and thrown back into the sea.
- (e) Shark fins, reportedly fetching up to \$10,000 a fin, are used to create the delectable shark fin soup in countries such as Hong Kong, China, Japan, Taiwan and Singapore.

- (A) abedc
- (B) bceda
- (C) dceab
- (D) ecbad
- (E) ebdca

- 11.** (a) Soon afterwards, Lata falls in love with a dashing young student at her university, whose name is Kabir.
- (b) Lata is Hindu, and Kabir is a name used by both Hindus and Muslims.
- (c) *A Suitable Boy* is the story of Lata Mehra and her search for a husband.
- (d) However, it turns out that Kabir is Muslim.
- (e) The novel opens with the wedding of Lata's elder sister Savita to Pran Kapoor and Mrs. Rupa Mehra's edict to Lata, 'You, too, will marry a boy I choose.'

- (A) cdeab
- (B) eabcd
- (C) ceabd
- (D) ebcda
- (E) cebad

- 12.** (a) Those who do remember him tend to use him as a cautionary tale.
- (b) His charismatic personality, combined with his controversial scientific accomplishments, landed him on TV more than once, notably on The Steve Allen Show.

- (c) Instead of dazzling audiences with complicated science, McConnell captivated them with awe-inspiring concepts.
- (d) McConnell's experiments have largely faded from scientific memory.
- (e) But at the end of the '50s, McConnell was a big deal.

- (A) cdbae
- (B) bcdae
- (C) daebc
- (D) edcba
- (E) aedbc

- 13.** (a) The band stretches from the Tropic of Cancer to the Tropic of Capricorn, though there are occasional reefs at higher latitudes—near Bermuda, for instance.
- (b) Reefs can be hundreds of feet tall and thousands of acres in area.
- (c) The world's largest reef, or really reef system, is the Great Barrier Reef, along the east coast of Australia.
- (d) Coral reefs are found in a band that circles the globe like a cummerbund.
- (e) Unlike the Great Wall of China, the Great Barrier Reef, which extends more than fourteen hundred miles, is actually visible from the space.

- (A) acdeb
- (B) dacbe
- (C) aedbc
- (D) dbcea
- (E) cdaeb

**14. (Real NMAT Question)**

- (a) In their first study, university students were asked to describe a difficult and an easy project that they intended to complete during the winter break.
- (b) For difficult projects, implementation intentions were clearly related to successful completion.
- (c) Projects included such things as writing a class paper, working on resolving family conflicts, and participating in athletic activities.
- (d) Students were also asked if they had specific plans about when, where and how to get started on each project.

- (e) Project completion was checked after students returned to school.

(A) abcde  
(B) bcdea  
(C) cdeab  
(D) acbde  
(E) dabce

15. (a) Science, to the ordinary reader of newspapers, is represented by a varying selection of sensational triumphs, such as wireless telegraphy and aeroplanes, radio-activity and the marvels of modern alchemy.
- (b) The increased command over the forces of nature which is derived from science is undoubtedly an amply sufficient reason for encouraging scientific research, but this reason has been so often urged and is so easily appreciated that other reasons, to my mind quite as important, are apt to be overlooked.
- (c) Science, in this aspect, consists of detached up-to-date fragments, interesting only until they are replaced by something newer and more up-to-date, displaying nothing of the systems of patiently constructed knowledge out of which, almost as a casual incident, have come the practically useful results which interest the man in the street.
- (d) It is with these other reasons, especially with the intrinsic value of a scientific habit of mind in forming our outlook on the world that I shall be concerned with.
- (e) However, it is not this aspect of science that I wish to speak of.
- (A) acbed  
(B) cebda  
(C) aebcd  
(D) bedac  
(E) aecbd

16. (Real NMAT Question)

- (a) As I got off at Terminal B, I couldn't help marvelling at the vastness of the O'Hare Airport.
- (b) My husband, who was very concerned that I was travelling alone, printed out a map of the airport before I left.
- (c) Since I did not have any pressing demands on my time, I decided to make the trip.
- (d) My sister, who lived in Seattle, wanted us to be present at her house-warming ceremony.

- (e) Although we tried very hard, we were able to obtain only one ticket for that date.

(A) abdec  
(B) badec  
(C) cdeba  
(D) dceba  
(E) decba

17. (a) Every cook knows that dry or ripe peas, and other farinaceous seeds, cannot easily be boiled in hard water because the farina of the seed is not perfectly soluble in water loaded with earthy salts.
- (b) In the culinary art, the effects of impure water are likewise obvious.
- (c) It cannot be denied that water that is hard, or loaded with earthy matter, has a decided effect upon some important functions of the human body.
- (d) However, the purity of the waters employed in some of the arts and manufactures, is an object of no less importance.
- (e) For example, in the art of the dyer, hard water not only opposes the solution of several dye stuffs, but it also alters the natural tints of some delicate colours.
- (A) cebad  
(B) cdeab  
(C) badec  
(D) beadc  
(E) cdeba
18. (a) In a treatise of about that time entitled 'Pneumatica', Hero, of Alexandria, described not only existing devices of his predecessors and contemporaries but also an invention of his own which utilised the expansive force of steam for raising water above its natural level.
- (b) While the time of man's first knowledge and use of the expansive force of the vapour of water is unknown, records show that such knowledge existed earlier than 150 B.C.
- (c) The third method, which is known as 'Hero's engine', made use of a hollow sphere that was rotated by steam.
- (d) However, Hero makes no suggestions as to application of this or any of the other devices he mentioned in his writings.
- (e) He clearly describes three methods in which steam might be used directly as a motive of power; raising water by its elasticity, elevating a



weight by its expansive power and producing a rotary motion by its reaction on the atmosphere.

- (A) baecd
- (B) ecdab
- (C) aecdb
- (D) bacde
- (E) ecdba

19. (a) Thus, it seems safe to conclude that pregnant women should absolutely avoid alcohol.
- (b) These babies generally exhibit facial distortion, inability to concentrate and difficulty in remembering.
- (c) In fact, the negative effects of alcohol on a fetus are so pronounced that babies born after exposure to alcohol are said to be suffering from fetal alcohol syndrome.
- (d) Because alcohol is delivered quickly into the blood and passes quickly into the tissues and membranes, the human fetus is particularly vulnerable to its effects.
- (e) One of the most dangerous drugs for pregnant women to consume is alcohol.
- (A) decba
  - (B) ecdba
  - (C) dcbae
  - (D) edcba
  - (E) eadbc
20. (a) The organisations have their reasons for such differential pricing such as expanding internet access in price sensitive markets such as India.
- (b) Airtel was recently under customer fire for pricing differentially calls made over the internet.
- (c) However, all these actions amount to violating net-neutrality and may result in discriminatory internet access to unsuspecting customers.
- (d) Reliance Communications too was under fire for offering Facebook access at a lower internet cost.
- (A) bcad
  - (B) bdac
  - (C) adcb
  - (D) abdc
  - (E) dcba

## 21. (Real NMAT Question)

- (a) No wonder companies everywhere have a stake in the health and fitness of their employees and are willing to spend considerable amounts for this purpose.
- (b) Our health is important to us, to our families and to our employers.
- (c) This is considered an important factor contributing to high productivity and quality work.
- (d) Japanese companies particularly excel in this and the more successful among them start off the day with a body bending and stretching session.
- (A) dbac
  - (B) abdc
  - (C) cabd
  - (D) badc
  - (E) bcda
22. (a) We, who live in India, may not have noticed this quirky behaviour because cricket is so intrinsic to our lives.
- (b) She saw some others wielding imaginary bats, hitting imaginary sixes and making 'tok' sounds with their tongues.
- (c) An NRI visiting Delhi said she noticed many boys and men volleying imaginary balls at an imaginary player while walking down a corridor or a footpath.
- (d) They did all this imaginary play, even when their thoughts were occupied somewhere else.
- (A) bcda
  - (B) cbda
  - (C) cadb
  - (D) badc
  - (E) abcd

## 23. (Real NMAT Question)

- (a) The flash floods in Uttarkashi caused unimaginable loss to life and property and was attributed to the mindless development of dams and felling of trees.
- (b) Due to the increasing incidents of such floods in India, a lot of questions are being raised on whether these flash floods are man-made disasters.

(c) Flash floods are sudden swelling of water bodies that usually overflow and flood adjoining low-lying areas.

(d) In fact, people posing these questions point to the flash floods in Uttarkashi in 2013.

- (A) adbc
- (B) bcad
- (C) cabd
- (D) cbda
- (E) dcab

24. (Real NMAT Question)

- (a) That translates to 20 products per minute!
- (b) Much more than that, it was about redefining customer experience and breaking online shopping inertia.
- (c) Started by two brothers, who not only saw their seed idea grow into a 4,500-member company, but also charted a stupendous success story with mind-numbing numbers, the online store had captured the shopping imagination of many.
- (d) The Bangalore-based firm ships more than 30,000 items per day.

- (A) cbad
- (B) cbda
- (C) cdab
- (D) acdb
- (E) adbc

25. (Real NMAT Question)

- (a) The final component of intimate relationships is usually commitment.
- (b) In short, commitment means persevering 'through thick and thin'.
- (c) Commitment shows a desire or keenness to continue a relationship into the future.
- (d) Research suggests that people associate commitment with a sense of loyalty and faithfulness.

- (A) acdb
- (B) abcd
- (C) bcda
- (D) cdab
- (E) dabc

26. (a) Group decision-making is inherently a convergent process.

(b) The primary goal is for members to agree on one of several decision options.

(c) Examples of such decision-making include a jury deciding a criminal's fate or a family choosing a vacation spot.

(d) In each of these cases, the task is to narrow the options down to one that is collectively endorsed by the group.

(e) In this sense, group decision-making seems to be the antithesis of group creativity.

- (A) abcde
- (B) adcbe
- (C) bcda
- (D) bcdea
- (E) abced

# Answer Key

The following discussion on answers and explanations is intended to familiarise you with the most efficient and effective approaches to these kinds of questions. Remember that it is the problem solving strategy that is important, not the specific details of a particular question.

## 1 Antonyms

### 1. RESTIVE

- (A) Craven
- (B) Anxious
- (C) Calm
- (D) Vigorous
- (E) Agile

*Restive* sounds like *rested*, but it actually means anxious or uneasy. The best answer, therefore, is *calm*.

*Craven*—cowardly

*Agile*—flexible

The correct answer is C.

### 2. PARTIAL

- (A) Disinterested
- (B) Biased
- (C) Apprehensive
- (D) Naive
- (E) Recondite

*Partial* means biased. *Disinterested* means unbiased and should be the best answer.

*Apprehensive*—cautious

*Naive*—innocent

*Recondite*—difficult to understand

The correct answer is A.

### 3. DIVULGE

- (A) Reveal
- (B) Evaluate
- (C) Refine
- (D) Store
- (E) Hide

*Divulge* means to reveal, so the opposite should be to *hide*.

The correct answer is E.

## 4. PUERILE (Real NMAT Question)

- (A) Childish
- (B) Mature
- (C) Pure
- (D) Silly
- (E) Viral

*Puerile* means childish or immature. So, the best answer is *mature*.

The correct answer is B.

## 5. CLANDESTINE

- (A) Destiny
- (B) Secret
- (C) Cataclysmic
- (D) Overt
- (E) Unaware

*Clandestine* means secret. The best answer then is *overt*, which means out in the open.

*Cataclysmic*—disastrous

The correct answer is D.

## 6. CONTENTIOUS

- (A) Arguable
- (B) Agreeable
- (C) Similar
- (D) Controversial
- (E) Truculent

*Contentious* means controversial. Thus, *agreeable* is the best antonym.

The correct answer is B.

## 7. LOQUACIOUS

- (A) Verbose
- (B) Voluble
- (C) Skeptical
- (D) Taciturn
- (E) Ruddy

*Loquacious* means talkative. *Taciturn* means silent and should be the correct answer.

The correct answer is D.

8. PEJORATIVE

- (A) Derogatory
- (B) Nugatory
- (C) Complimentary
- (D) Simple
- (E) Oratorical

Pejorative means derisive or insulting. Thus, complimentary is the best antonym.

The correct answer is C.

9. RELINQUISH

- (A) Abandon
- (B) Prevaricate
- (C) Renege
- (D) Abdicate
- (E) Continue

Relinquish means to give up or to surrender.

Abandon—give up

Prevaricate—lie

Renege—break a promise

Abdicate—synonym of relinquish

The correct answer is E.

10. EMACIATED

- (A) Corpulent
- (B) Emancipate
- (C) Luminous
- (D) Verbose
- (E) Tawdry

Emaciated means very thin.

Corpulent—fat or fleshy

Emancipate—liberate

Luminous—glowing

Verbose—wordy or talkative

Tawdry—cheap

The correct answer is A.

11. AMALGAMATE

- (A) Merge
- (B) Divide
- (C) Allay
- (D) Absolve
- (E) Endure

Amalgamate means to combine. Thus, the correct answer is divide.

The correct answer is B.

12. STOIC

- (A) Indomitable
- (B) Agitated
- (C) Sycophant
- (D) Serene
- (E) Impassive

Stoic means unemotional or calm. Thus, agitated is the best antonym.

The correct answer is B.

13. PERNICIOUS (*Real NMAT Question*)

- (A) Useful
- (B) Harmless
- (C) Profitable
- (D) Healthy
- (E) Wholesome

Pernicious means harmful. The best answer is harmless.

The correct answer is B.

14. MYOPIC

- (A) Hypochondriac
- (B) Vindictive
- (C) Bigoted
- (D) Self-centered
- (E) Far-sighted

Myopic means short-sighted. Thus, far-sighted is the best antonym.

The correct answer is E.

15. BLITHE

- (A) Dim-witted
- (B) Flexible
- (C) Agile
- (D) Solemn
- (E) Laconic

*Blithe* means light hearted or relaxed. The opposite should be gloomy or *solemn*.

The correct answer is D.

16. ABROGATE (Real NMAT Question)

- (A) Promulgate
- (B) Suggest
- (C) Finalise
- (D) Initiate
- (E) Ratify

*Abrogate* means to annul or repeal. The opposite should be to confirm or approve. *Ratify* is the best answer.

The correct answer is E.

17. MALADROIT

- (A) Healthy
- (B) Joyous
- (C) Skilled
- (D) Inept
- (E) Injudicious

*Maladroit* means lacking skill. Thus, *skilled* is the correct answer.

The correct answer is C.

18. LOCAL

- (A) Regional
- (B) Wide
- (C) Tendentious
- (D) Catholic
- (E) Limited

*Local* pertains to a limited area. The opposite then should be universal, which is what *Catholic* also means. Note that regional cannot be the answer because even regional can be referred to as local.

The correct answer is D.

19. RECALCITRANT (Real NMAT Question)

- (A) Contumacious
- (B) Convincing
- (C) Incurrigible
- (D) Tractable
- (E) Contrary

*Recalcitrant* is being uncooperative or rebellious towards authority and discipline. The only word that is close to being an antonym is *tractable*, which means easily influenced.

The correct answer is D.

20. CONSTRICT

- (A) Bellow
- (B) Sublime
- (C) Reject
- (D) Submerge
- (E) Dilate

*Constrict* means to narrow down. The opposite then should be to widen or *dilate*.

The correct answer is E.

21. ASSUAGE (Real NMAT Question)

- (A) Point
- (B) Add on
- (C) Aggravate
- (D) Ameliorate
- (E) Accentuate

*Assuage* means to make something feel less intense, especially used for something unpleasant. The closest and best antonym among the options is *aggravate*.

The correct answer is C.

## 22. EXCULPATE

- (A) Exonerate
- (B) Prove guilty
- (C) Show anxiety
- (D) Avoid responsibility
- (E) Ameliorate

*Exculpate* means to free from blame. The opposite should be to prove deserving of blame, that is *prove guilty*.

The correct answer is B.

23. LIMPID (*Real NMAT Question*)

- (A) Pellucid
- (B) Opaque
- (C) Insipid
- (D) Lucent
- (E) Lucid

*Limpid* means *clear and transparent*—the antonym of this is easily *opaque*.

The correct answer is B.

## 24. INSULAR

- (A) Unbiased
- (B) Circumscribed
- (C) Isolated
- (D) Dispassionate
- (E) Insouciant

*Insular* means *parochial or conservative*. Thus, *unbiased* is the best antonym.

The correct answer is A.

## 2 Analogies

### 1. CRIME : POLICE

- (A) Watchman : Theft
- (B) Food : Eat
- (C) Weight : Exercise
- (D) Flood : Dam
- (E) Play : Football

Start by making a bridge between the words given in the question stem—The function of **police** is to control **crime**.

Now, plug the bridge into the answer choices:

- (A) The function of a **theft** is to control **watchman**.  
Incorrect (*be careful as the bridge is not this—the job of a watchman is to control theft*).
- (B) The function of **eat** is control **food**. Incorrect.
- (C) The function of **exercise** is to control **weight**.  
Not necessarily. People may exercise for other reasons as well, such as to improve their general fitness even if they are not overweight.
- (D) The function of a **dam** is to control **floods**.  
**Correct.**
- (E) The function of a **football** is to control **play**.  
Incorrect.

The correct answer is D.

### 2. CLEAVER : BUTCHER

- (A) Screwdriver : Mechanic
- (B) Treadmill : Runner
- (C) Pen : Writer
- (D) Scalpel : Surgeon
- (E) Brush : Painter

We basically need to fine tune our bridge so that we end up with a unique answer. One way of doing that could be to use the bridge—Clever is used by a butcher to cut. Similarly, a scalpel is used by a surgeon to cut. None of the other options contain a cutting instrument. Hence, (D) is the only option that satisfies the rule.

The correct answer is D.

### 3. EXPAND : AREA

- (A) Bend : Flexibility
- (B) Noxious : Escape
- (C) Drone : Monotonous
- (D) Proliferate : Number
- (E) Length : Increase

Here is the bridge between the words in the question stem—to **expand** is to increase the area.

Plugging this bridge in the answer choices, we get:

- (A) To **bend** is to increase the **flexibility**—Incorrect
- (B) To **noxious** is to increase the **escape**—Incorrect.
- (C) To **drone** is to increase the **monotonous**—Incorrect.
- (D) To **proliferate** is to increase the **number**—**Correct.**
- (E) To **length** is to increase the **increase**—Incorrect.

The correct answer is D.

### 4. CRITIC : FAULT

- (A) Artist : Praise
- (B) Amateur : Persevere
- (C) Athlete : Practice
- (D) Arbitrator : Mediate
- (E) Thief : Arrest

Here is the bridge between the words in the question stem—the work of a **critic** is to (find) **fault**.

Plugging this bridge in the answer choices, we get:

- (A) The work of an **artist** is to **praise**—Incorrect.
- (B) The work of an **amateur** is to **persevere**—Incorrect.
- (C) The work of an **athlete** is to **practice**—Incorrect (This is not the 'work' of an athlete. The work of an athlete would be to compete.)
- (D) The work of an **arbitrator** is to **mediate**—**Correct.**
- (E) The work of a **thief** is to **arrest**—Incorrect.

The correct answer is D.

### 5. ACROBAT : AGILITY

- (A) Engineer : Clarity
- (B) Student : Perseverance
- (C) Surgeon : Dexterity
- (D) Entrepreneur : Capital
- (E) Lawyer : Courtroom

Here is the bridge between the words in the question stem—an **acrobat** requires **agility** ('agility' means flexibility).

Plugging this bridge in the answer choices, we get:

- (A) An **engineer** requires **clarity**—Incorrect.
- (B) A **student** requires **perseverance**—Incorrect.

- (C) A **surgeon** requires **dexterity**—Correct.  
 (D) An **entrepreneur** requires **capital**—Not necessarily (There are businesses that can be started with little or no capital.)  
 (E) A **lawyer** requires a **courtroom**—Not necessarily.

The correct answer is C.

# 6. JOY : EUPHORIA

- (A) Misery : Sorrow  
 (B) Triumph : Ecstasy  
 (C) Write : Type  
 (D) Punish : Scold  
 (E) Anger : Wrath

Here is the bridge between the words in the question stem—**euphoria** is a higher degree of **joy** (note that we are starting with the second word).

Plugging this bridge in the answer choices, we get:

- (A) **Sorrow** is a higher degree of **misery**—Incorrect (Sorrow is the same as misery.)  
 (B) **Ecstasy** is a higher degree of **triumph**—Incorrect.  
 (C) **Type** is a higher degree of **write**—Incorrect.  
 (D) **Scold** is a higher degree of **punish**—Incorrect (They are almost the same thing.)  
 (E) **Wrath** is a higher degree of **anger**—Correct.

The correct answer is E.

# 7. CAPTAIN : SHIP

- (A) Teacher : School  
 (B) Manager : Office  
 (C) Guide : Tourist  
 (D) Doctor : Hospital  
 (E) Hotel : Concierge

Captain manages all the activities on a ship. Similarly, a manager manages all the activities in an office.

The correct answer is B.

# 8. DEBACLE : FAILURE

- (A) Disaster : Catastrophe  
 (B) Steal : Theft  
 (C) Carrot : Vegetable  
 (D) Murder : Crime  
 (E) Ecstasy : Joy

Start by making a bridge between the words given in the question stem—**debacle** is a high degree (or an extreme form) of **failure**.

Now, plug the bridge into the answer choices:

- (A) **Disaster** is a higher degree of **Catastrophe**—Incorrect. (It is actually the other way around—catastrophe is a higher degree of disaster.)  
 (B) **Steal** is a higher degree of **theft**—Incorrect.  
 (C) **Carrot** is a higher degree of **vegetable**—Incorrect.  
 (D) **Murder** is a higher degree of **crime**—Incorrect. (Murder can be a heinous crime but it is not a higher degree of crime. Crime cannot have degrees in the way it is implied in the original bridge.)  
 (E) **Ecstasy** is a higher degree of **joy**—Correct.

The correct answer is E.

# 9. DISLIKE : LOATHE

- (A) Pain : Discomfort  
 (B) Coward : Foolhardy  
 (C) Disquiet : Anxious  
 (D) Fear : Stress  
 (E) Joy : Ecstasy

**Loathe** is a high degree of **dislike**. Similarly, **Ecstasy** is a high degree of **Joy**. Note that Option C contains a pair of synonyms.

The correct answer is E.

# 10. LIQUID : MELT

- (A) Gas : Vaporise  
 (B) Criminal : Arrest  
 (C) Tourist : Travel  
 (D) Ice : Freeze  
 (E) Scholar : Study

Start by making a bridge between the words given in the question stem—To **melt** something is to turn it into a **liquid**.

Now, plug the bridge into the answer choices:

- (A) To **vaporise** something is to turn it into a **gas**—Correct.  
 (B) To **arrest** someone is to turn him into a **criminal**—Incorrect.  
 (C) To **travel** is to turn into a **tourist**—Incorrect. (There is no change of form taking place in this case, unlike in the original bridge.)



- (D) To **freeze** is to turn something into **ice**—Incorrect. (Do not let this one confuse you. To freeze is to turn something into solid but not necessarily into ice.)
- (E) To **study** is to turn into a **scholar**—Incorrect.

The correct answer is A.

11. SPECIOUS : VERACITY

- (A) Corruption : Scruples  
(B) Wealth : Money  
(C) Variegation : Colour  
(D) Enervation : Nervous  
(E) Locomotion : Movement

Here is the bridge between the words in the question stem—**specious** means a lack of **veracity** ('specious' means false or deceptive and 'veracity' means truth).

Plugging this bridge in the answer choices, we get:

- (A) **Corruption** means lack of **scruples**—Correct ('Scruples' means morals.)
- (B) **Wealth** means a lack of **money**—Incorrect.
- (C) **Variegation** means a lack of **colour**—Incorrect.
- (D) **Enervation** means a lack of **nervousness**—Incorrect (It means 'tired'.)
- (E) **Locomotion** means a lack of **movement**—Incorrect.

The correct answer is A.

12. ALTRUISTIC : SELFISHNESS

- (A) Enlightened : Wisdom  
(B) Befuddled : Clarity  
(C) Flippant : Calm  
(D) Assiduous : Diligence  
(E) Depressed : Sorrow

An altruistic person lacks selfishness. Similarly, a befuddled person lacks clarity.

The correct answer is B.

13. TRIM : HAIR

- (A) Shave : Beard  
(B) Prune : Hedge  
(C) Reap : Crop  
(D) Dismiss : Guilt  
(E) Admonish : Scold

Here is the bridge between the words in the question stem—to **trim** is to reduce the length of hair.

Plugging this bridge in the answer choices, we get:

- (A) To **shave** is to reduce the length of **beard**—Incorrect (This actually means to remove beard completely and not to reduce its length.)
- (B) To **prune** is to reduce the length of **hedge**—Correct.
- (C) To **reap** is to reduce the length of **crop**—Incorrect.
- (D) To **dismiss** is to reduce the length of **guilt**—Incorrect.
- (E) To **admonish** is to reduce the length of **scold**—Incorrect.

The correct answer is B.

14. EULOGY : PRAISE

- (A) Rant : Fear  
(B) Heretic : Convention  
(C) Lambast : Redeem  
(D) Elegy : Lament  
(E) Catastrophe : Trauma

Here is the bridge between the words in the question stem—a **eulogy** always contains **praise**.

Plugging this bridge in the answer choices, we get:

- (A) A **rant** always contains **fear**—Incorrect.
- (B) A **heretic** always contains **convention**—Incorrect.
- (C) A **lambast** always contains **redeem**—Incorrect.
- (D) An **elegy** always contains **lament**—Correct.
- (E) A **catastrophe** always contains **trauma**—Not necessarily

The correct answer is D.

15. REPRIMAND : CENSURE

- (A) Cower : Menace  
(B) Jeer : Derision  
(C) Fidget : Caution  
(D) Alert : Vigilant  
(E) Resistance : Violence

Here is the bridge between the words in the question stem—**reprimand** is an act of **censure**.

Plugging this bridge in the answer choices, we get:

- (A) **Cower** is an act of **menace**—Incorrect (It is an act of fear.)  
 (B) **Jeer** is an act of **derision**—Correct.  
 (C) **Fidget** is an act of **caution**—Incorrect (It is an act of nervousness.)  
 (D) **Alert** is an act of **vigilance**—Incorrect.  
 (E) **Resistance** is an act of **violence**—Not necessarily

The correct answer is B.

16. EXIGENCY : CRISIS (*Real NMAT Question*)

- (A) Liberty : Rights  
 (B) Captivity : Prison  
 (C) Curfew : Sundown  
 (D) Mayhem : Rush-hour  
 (E) Preparedness : Eventuality

Here the bridge between the words in the question stem – a situation of **exigency** can lead to a **crisis**.

Plugging this bridge in the answer choices, we get:

- (A) A situation of **liberty** can lead to **rights** – Not necessarily.  
 (B) A situation of **captivity** can lead to **prison** – Incorrect.  
 (C) A situation of **curfew** can lead to **sundown** – Incorrect.  
 (D) A situation of **mayhem** can lead to **rush-hour** – Incorrect.  
 (E) A situation of **preparedness** can lead to an **eventuality** – Correct.

The correct answer is E.

### 3 Synonyms

#### 1. EXPENDABLE

- (A) Gushing
- (B) Anomaly
- (C) Dejected
- (D) Superfluous
- (E) Parsimonious

Expendable means something that is not vital or that can be done away with. Thus *superfluous* is the best synonym.

The correct answer is D.

#### 2. SERENDIPITY

- (A) Pity
- (B) Sympathy
- (C) Good luck
- (D) Sarcasm
- (E) Reclusive

Serendipity means good luck or good fortune. Thus, (C) is the best answer.

*Sarcasm*—irony; taunt

*Reclusive*—someone who stays away from people or society

The correct answer is C.

#### 3. DISTRAUGHT

- (A) Subservient
- (B) Composed
- (C) Authoritative
- (D) Dogmatic
- (E) Agitated

Distraught means agitated or very anxious. Thus, agitated is the best synonym.

The correct answer is E.

#### 4. PHILANTHROPY

- (A) Charity
- (B) Philander
- (C) Flounder
- (D) Misanthrope
- (E) Anathema

Philanthropy means charity. Thus, (A) is the best answer.

*Philander*—to flirt

*Flounder*—to struggle

*Misanthrope*—someone who hates humans  
*Anathema*—a curse

The correct answer is A.

#### 5. HYPERBOLE

- (A) Infestation
- (B) Exaggeration
- (C) Compression
- (D) Generosity
- (E) Greed

Hyperbole means exaggerated speech, making exaggeration the correct answer.

The correct answer is B.

#### 6. TENDENTIOUS (Real NMAT Question)

- (A) Aberrant
- (B) Partisan
- (C) Incoherent
- (D) Meticulous
- (E) Surreptitious

Tendentious means biased. Thus, partisan is the best answer.

The correct answer is B.

#### 7. HARBINGER

- (A) Kleptomaniac
- (B) Vagabond
- (C) Catholic
- (D) Precursor
- (E) Successor

Harbinger means a precursor or an omen.

*Kleptomaniac*—someone who has an incurable urge to steal

*Vagabond*—a wanderer

*Catholic*—universal

The correct answer is D.

#### 8. EXIGENT

- (A) Lax
- (B) Deferrable
- (C) Critical
- (D) Routine
- (E) Heroic

Exigent means urgent. Thus, critical is the correct answer.

The correct answer is C.

## 9. JEER

- (A) Compliment
- (B) Cheer
- (C) Mock
- (D) Castigate
- (E) Flatter

To *jeer* is to taunt or to make fun of.  
*Castigate*—criticise or condemn

The correct answer is C.

## 10. RELENTLESS

- (A) Lenient
- (B) Dogged
- (C) Painsstaking
- (D) Intermittent
- (E) Ephemeral

*Relentless* means determined or resolute. Thus *dogged* is the best synonym.

The correct answer is B.

## 11. TENUOUS

- (A) Substantial
- (B) Nervous
- (C) Rude
- (D) Flimsy
- (E) Attenuate

*Tenuous* means thin or lacking substance. *Flimsy* comes closest to it in meaning and should be the correct answer.

The correct answer is D.

## 12. ABATE

- (A) Obdurate
- (B) Ossify
- (C) Preclude
- (D) Elevate
- (E) Lessen

*Abate* means to lessen or reduce in intensity. Thus, *lessen* is the correct answer.

The correct answer is E.

13. TUMULTUOUS (*Real NMAT Question*)

- (A) Blissful
- (B) Flagrant
- (C) Odious
- (D) Opulent
- (E) Turbulent

*Tumultuous* means disturbed or agitated. *Turbulent* is the best answer.

The correct answer is E.

## 14. LATENT

- (A) Overt
- (B) Hidden
- (C) Casual
- (D) Bellicose
- (E) Ubiquitous

*Latent* means hidden or not obvious. Thus, *hidden* is the correct answer.

The correct answer is B.

## 15. CORROBORATE

- (A) Corrupt
- (B) Abdicate
- (C) Denigrate
- (D) Substantiate
- (E) Abnegate

*Corroborate* means to support or strengthen. *Substantiate* comes closest to this in meaning and should be the correct answer.

The correct answer is D.

16. ADVERSITY (*Real NMAT Question*)

- (A) Boredom
- (B) Hardship
- (C) Dynamics
- (D) Monotony
- (E) Dishonesty

*Adversity* means suffering or hardship, so *hardship* is the correct answer.

The correct answer is B.

**17. FALLOW**

- (A) Fertile
- (B) Lush
- (C) Barren
- (D) Vigorous
- (E) Ruddy

*Fallow* means barren or unproductive. Thus, *barren* is the correct answer.

**The correct answer is C.**

**18. PILLORY (Real NMAT Question)**

- (A) Broach
- (B) Dampen
- (C) Placate
- (D) Relegate
- (E) Disparage

*Pillory* means to humiliate or criticise publicly. The best and closest synonym among the options provided is *disparage*, which means to make one feel worthless.

**The correct answer is E.**

**19. PROCLIVITY**

- (A) Dislike
- (B) Passion
- (C) Prehensile
- (D) Anachronistic
- (E) Predisposition

*Proclivity* means a natural liking or inclination towards something. *Predisposition* means the same and should be the correct answer.

**The correct answer is E.**

**20. ADDLE**

- (A) Combine
- (B) Discreet
- (C) Befuddle
- (D) Abject
- (E) Obdurate

*Addle* means to confuse. *Befuddle* also means the same and should be the correct answer.

**The correct answer is C.**

**21. TRITE**

- (A) Innovative
- (B) Exiguous
- (C) Hackneyed
- (D) Opportune
- (E) Pertinent

*Trite* refers to a clichéd, unoriginal remark or idea. *Hackneyed* is the correct synonym.

**The correct answer is C.**

**22. DWINDLE**

- (A) Enhance
- (B) Ebb
- (C) Voracious
- (D) Diminish
- (E) Surge

*Dwindle* is to gradually reduce in size or amount. *Diminish* is the best synonym.

**The correct answer is D.**

## 4 Fill in the Blanks

1. One requirement of a good book is that it deepen and extend our knowledge, not that it merely \_\_\_\_\_ what we already know.

(A) enhance  
(B) confirm  
(C) modify  
(D) reduce  
(E) vilify

**Keyword**—deepen and extend our knowledge

**Connector**—not (contrast)

The word that goes in the blank has to contrast with the keyword

**Prediction**—reiterate, restate

*Confirm* comes closest to our prediction and should be the correct answer.

The correct answer is B.

2. Some people might believe that measuring sleepiness is a fairly \_\_\_\_\_ task, but it is of paramount importance to a sleep researcher.

(A) easy  
(B) trivial  
(C) straightforward  
(D) arduous  
(E) noisome

**Keyword**—it is of paramount importance

**Connector**—but (contrast)

The blank needs a negative word to contrast with paramount importance

**Prediction**—useless, unimportant

*Trivial* comes closest to our prediction and should be the correct answer.

The correct answer is B.

3. As soon as \_\_\_\_\_ with an aerial salt, water is formed. (*Real NMAT Question*)

(A) basic reaction  
(B) a base reacts  
(C) a base will react  
(D) a base is reacting  
(E) the reaction of a base

**Keyword**—water is formed

**Connector**—as soon as

We need the simple present tense 'reacts' in this sentence.

The correct answer is B.

4. There are many things to be said against American newspapers, but much of the \_\_\_\_\_ is \_\_\_\_\_ when one considers that every now and then they develop a great writer like Don Marquis.

(A) blandishment; kindled  
(B) somnolence; underscored  
(C) indictment; quashed  
(D) criticism; upheld  
(E) applause; negated

**Keyword**—many things to be said against

**Connector**—but (contrast)

**Prediction for Blank 1**—criticism, complaint

**Prediction for Blank 2**—acceptable, worthwhile

*Indictment* and *quashed* come closest to our prediction and should be the correct answer

The correct answer is C.

5. Even though human beings \_\_\_\_\_ in certain aspects, fundamentally they are similar.

(A) coexist  
(B) differ  
(C) quarrel  
(D) agree  
(E) astound

**Keyword**—fundamentally they are similar

**Connector**—even though (contrast)

The connector implies a contrast, so we need to go with a word that contrasts with the keyword.

**Prediction**—differ, contrasts, opposite to

*Differ* exactly matches our prediction and should be the correct answer.

The correct answer is B.

6. While there is no doubt that Manchester City is \_\_\_\_\_ (i) \_\_\_\_\_ football team, whether they are able to perform to their \_\_\_\_\_ (ii) \_\_\_\_\_ in the upcoming Premier League season remains to be seen.

(A) a boring.....talent  
 (B) a good.....detriment  
 (C) an average.....capability  
 (D) an excellent.....potential  
 (E) an upcoming.....spectators

The second blank could be easier to start with in this sentence. 'Perform to your *potential*' is a commonly used expression in English and suggests the presence of ability or skill. From this, the first blank needs to have a positive connotation. Option D fits this meaning the best.

**The correct answer is D.**

7. Allergy to gluten has become surprisingly common in recent times. Even the products made by companies that do not use any gluten in their manufacturing process \_\_\_\_\_ be considered completely \_\_\_\_\_ since there is no guarantee that gluten will not be present in the raw materials that these companies use to make their products.

(A) cannot.....benign  
 (B) should.....unsafe  
 (C) will not.....vulnerable  
 (D) claim to.....harmless  
 (E) are not to.....inconspicuous

The use of *even* suggests that we need to look for a contrast. Thus, even companies that do not add gluten to any of their products *cannot* be considered completely safe for the reason mentioned in the sentence. Option A fits this meaning the best.

**The correct answer is A.**

8. Jonathan wanted to \_\_\_\_\_ psychology as his major, but his parents wanted him to study engineering. (*Real NMAT Question*)

(A) cope  
 (B) attest  
 (C) choice  
 (D) enrich  
 (E) declare

**Keyword**—wanted him to study

**Connector**—but (contrast)

**Prediction**—choose, select

*Declare* comes closest to our prediction and should be the correct answer.

**The correct answer is E.**

9. The judges for the cooking show were true \_\_\_\_\_, noting subtle differences between dishes that most people would not detect.

(A) dilettantes  
 (B) iconoclasts  
 (C) neophytes  
 (D) gourmands  
 (E) dissidents

**Keyword**—noting subtle differences between dishes

**Connector**—None (same direction)

The sentences suggest that the judges were basically very good in their field

**Prediction**—experts, masters

**The correct answer is D.**

10. The findings of a recent study provide an interesting example of the process of natural selection—certain light coloured animals living in environments that have been \_\_\_\_\_ soot and other forms of pollution, eventually take on a darker colouration.

(A) painted with  
 (B) coloured with  
 (C) satiated with  
 (D) exposed to  
 (E) whetted in

The word that goes in the blank should mean something like *covered with soot*. Option D fits this best.

**The correct answer is D.**

11. The sound produced by the newly formed band was so \_\_\_\_\_ that even its least experienced members were abashed.

(A) sonorous  
 (B) caustic  
 (C) mellifluous  
 (D) indigent  
 (E) strident

**Keyword**—members were abashed

**Connector**—so.....that (same direction)

The blank needs a negative word because the members were abashed or ashamed at the sound

**Prediction**—noisy, unpleasant

The correct answer is E.

12. According to one point of view, it is not correct to use compassion as a \_\_\_\_\_ (i) \_\_\_\_\_ principle because it is based on the assumption that just because an animal is like me in certain aspects, it will be like me in some other aspects as well. \_\_\_\_\_ (ii) \_\_\_\_\_, this is an erroneous means of proving identity because it ignores the various historical, cultural and other references that might have crept in. Just because an animal looks like us does not mean that it is actually like us.
- (A) a universal.....moreover  
(B) a discriminating.....furthermore  
(C) a subjective.....surprisingly  
(D) a contentious.....nonetheless  
(E) a differentiating.....however
- It looks difficult to make a prediction for the first blank. While you may feel that the last sentence of the given paragraph is superfluous and not pay much attention to it, it is in fact this sentence that provides you a vital context to the overall paragraph—it is trying to *distinguish* between a human and an animal. Thus, the first blank needs to be B or E. Note that the second blank is showing a contrast with the sentence directly before it (and not with the first sentence). Thus, it needs to start with a contrasting word such as *however*.

The correct answer is E.

13. Despite her age and exposure to the world, she has an asinine and \_\_\_\_\_ personality.  
(Real NMAT Question)
- (A) mature  
(B) immature  
(C) cultivated  
(D) materialistic  
(E) sophisticated

**Keyword**—asinine

**Connector**—and (same direction)

**Prediction**—silly, childish

*Immature* comes closest to our prediction and should be the correct answer.

The correct answer is B.

14. Successful government programs have helped \_\_\_\_\_ poverty and inequality in the last couple of decades, but compared with rich countries, Latin American countries \_\_\_\_\_ fall short.

- (A) elevate; understandably  
(B) alleviate; still  
(C) erase; no longer  
(D) invigorate; do not  
(E) castigate; will not

**Keyword**—Successful government programs

**Connector**—but (contrast)

The Keyword indicates that the first blank should be positive and the second blank should contrast with this

**Prediction for Blank 1**—counter, reduce

**Prediction for Blank 2**—continue to

*Alleviate* and *still* come closest to our prediction and should be the correct answer

The correct answer is B.

15. Modern science has proved that the fundamental traits of every individual are \_\_\_\_\_ stamped in the shape of his body, head, face and hands—an X-ray by which one can read the characteristics of any person on sight.
- (A) superficially  
(B) equivocally  
(C) indelibly  
(D) fleetingly  
(E) inevitably

**Keyword**—traits of every individual are stamped

**Connector**—none (same direction)

**Prediction for Blank**—permanently

*Indelibly* comes closest to our prediction and should be the correct answer.

The correct answer is C.

16. A brave and highly decorated officer, the Army General is \_\_\_\_\_ as a brilliant strategist and a reform-minded leader who is unforgiving of corruption, as reflected in the hard line he adopted against \_\_\_\_\_ officers in the recent housing scam.
- (A) propounded; scrupulous  
(B) reviled; crooked  
(C) revered; erring



- (D) regarded as; pious  
(E) looked down upon; corrupt

**Keyword**—A brave and highly decorated officer

**Connector**—as (same direction)

**Prediction for Blank 1**—considered, believed to be

**Prediction for Blank 3**—corrupt, guilty

*Revered* and *erring* come closest to our prediction and should be the correct answer.

The correct answer is C.

17. \_\_\_\_\_ his essays and lectures, Emerson left behind some poetry in which are \_\_\_\_\_ those thoughts which were to him too deep to be expressed as prose.

- (A) as a result of; precluded  
(B) for; contained  
(C) despite; missing  
(D) besides; embodied  
(E) in addition to; removed

**Keyword**—thoughts which were to him too deep for prose expression

**Connector**—is actually the first blank

The sentence implies a contrast between essays and poetry, so the Connector has to bring this out.

**Prediction for Blank 1**—In addition to, Apart from

**Prediction for Blank 2**—contained, mentioned

*Besides* and *embodied* come closest to our prediction and should be the correct answer.

The correct answer is D.

18. I read the other day some verses written by an eminent painter, which were \_\_\_\_\_ and not \_\_\_\_\_.

- (A) prosaic; stolid  
(B) iconoclastic; conventional  
(C) verbose; prolix  
(D) sacrilegious; blasphemous  
(E) droll; humorous

**Keyword**—none

**Connector**—not (contrast)

Because of the implied contrast, we need to find a pair of words that are opposite in meaning. Since the sentence does not have a Keyword as such, there will only be one such pair possible.

**Prediction for Blank 1**—none

**Prediction for Blank 2**—none

The only possible combination of contrasting words is *iconoclastic* and *conventional*. These should be the correct answer.

The correct answer is B.

19. \_\_\_\_\_ for a vote-bank, the members of parliament \_\_\_\_\_ started a brawl.  
(*Real NMAT Question*)

- (A) shyly; boldly  
(B) anxiety; calmness  
(C) reticence; timorously  
(D) hopelessness; timidly  
(E) desperation; brazenly

**Keyword**—started a brawl

**Connector**—none (same direction)

**Prediction for Blank 1**—desire

**Prediction for Blank 2**—blatantly or shamelessly

*Desperation* and *brazenly* come closest to our prediction and should be the correct answer.

The correct answer is E.

20. Many items of clothing are worn purely for traditional or ceremonial purposes—because the occasion demands it. For example, the tie has no \_\_\_\_\_ function that anyone can explain, yet most people working in a corporate environment would rarely be seen without one.

- (A) accepted  
(B) rational  
(C) critical  
(D) illogical  
(E) peculiar

The word that goes into the blank should mean something on the lines of *logical*—even though a tie has no logical purpose, most people wear it. Options A, C and D can then be immediately eliminated. Between B and E, note that the words after the blank say that *anyone can explain*. Something *irrational* is something that cannot be logically explained. Thus, the opposite of *irrational*, that is, *rational* fits best into the blank.

The correct answer is B.

21. In a rather surprising incident, Mr. Lal, the noted politician, who is otherwise known for his tact and \_\_\_\_\_, came up with such an \_\_\_\_\_ and unsatisfactory reply to the question. (*Real NMAT Question*)

(A) guile; imperative  
(B) stoicism; underhand  
(C) perception; indiscreet  
(D) sensitivity; insuperable  
(E) intelligence; unconditional

**Keyword**—rather surprising incident

**Connector**—otherwise (contrast)

**Prediction for Blank 1**—something on the lines of tact

**Prediction for Blank 2**—poorly worded

Using the first blank, we can narrow down to options C and E. The use of *unconditional* in the second blank does not make sense.

The correct answer is C.

22. To some people, life is hard, cruel and \_\_\_\_\_. These set of people see life as a punishment and, therefore, \_\_\_\_\_ themselves to fate, believing all is finished.

(A) sanguine; give up  
(B) unforgiving; torpor  
(C) salutary; sacrifice  
(D) remorseless; fight  
(E) unsparing; resign

**Keyword**—believing all is finished

**Connector**—none (same direction)

**Prediction for Blank 1**—any negative word

**Prediction for Blank 2**—give themselves up

*Unsparing* and *resign* come closest to our prediction and should be the correct answer.

The correct answer is E.

23. When a terrier comes into the room, you instinctively draw away \_\_\_\_\_ you want to be jumped at and greeted effusively, but you make no such movement to protect yourself from a St. Bernard because you read, on sight, the \_\_\_\_\_ natures of these two from their external appearance.

(A) because; stoic  
(B) nonetheless; tractable  
(C) for; incomprehensible

(D) unless; disparate

(E) as; enthusiastic

**Keyword**—believing all is finished

**Connector**—But (contrast)

**Prediction for Blank 1**—unless

**Prediction for Blank 2**—different

*Unless* and *disparate* come closest to our prediction and should be the correct answer.

The correct answer is D.

24. Changes to the world economy have had \_\_\_\_\_ effect on the nationalities of private-jet buyers. A market that as recently as 15 years ago was \_\_\_\_\_ by American clients now reflects the rise of smaller nations.

(A) an obviating; yielded  
(B) a considerable; eschewed  
(C) a deleterious; led  
(D) an ameliorating; loved  
(E) a telling; dominated

**Keyword**—rise of smaller nations

**Connector**—none (same direction)

**Prediction for Blank 1**—an important

**Prediction for Blank 2**—filled

*a telling* and *dominated* come closest to our prediction and should be the correct answer.

The correct answer is E.

## 5 Cloze Test

Lady Hawkins had earned the \_\_\_\_\_ (1) \_\_\_\_\_ of her extensive family by marrying below her station and moving into her poor husband's \_\_\_\_\_ (2) \_\_\_\_\_, shabby house. Her father refused to talk to her and her brothers had \_\_\_\_\_ (3) \_\_\_\_\_ all roads to reconciliation by publicly declaring that they never had a sister. The family was in shock that a genteel lady, strictly brought up in \_\_\_\_\_ (4) \_\_\_\_\_ to rules that governed society, would actually take such a step.

1. (A) ire  
(B) veneration  
(C) love  
(D) sympathy  
(E) guilt

If you read the entire passage, it becomes clear that Lady Hawkins' family is upset with her. So the correct word should be *upset* or *angry*. *Ire* comes closest to this and should be the correct answer.

*Veneration*—high degree of respect

The correct answer is A.

2. (A) uncouth  
(B) malignant  
(C) lavish  
(D) ornate  
(E) dilapidated

The keyword here is *shabby*, which tells us that the word that goes in the blank has to be a negative word. This eliminates (C) and (D). *Uncouth* and *malignant*, while both negative terms, are not used for a house. *Dilapidated* is the perfect answer, as it means in a state of disrepair and is typically used for buildings.

*Uncouth*—ill mannered

*Malignant*—harmful

*Ornate*—beautiful or embellished

The correct answer is E.

3. (A) reverberated  
(B) decimated  
(C) obfuscated  
(D) revealed  
(E) ridiculed

The sentence is saying that her brothers had broken or blocked all roads to reconciliation, that is, they do

not want a reconciliation. The best answer then has to be *decimated* which means to destroy.  
*Reverberate*—to echo or vibrate  
*Obfuscate*—to confuse

The correct answer is B.

4. (A) denouncement  
(B) dissonance  
(C) absence  
(D) deference  
(E) scorn

The sentence is saying that Lady Hawkins had been brought up in accordance with the said rules. Thus, the best answer should be *deference*, which means respect. She was taught to respect the rules that governed society.

*Denouncement*—to condemn openly

*Dissonance*—discord or disagreement

*Scorn*—contempt or disdain

The correct answer is D.

The dilapidated building at the end of Andover road had always been a point of dispute in the neighbourhood. In an \_\_\_\_\_ (5) \_\_\_\_\_ to the modern buildings around it, it's \_\_\_\_\_ (6) \_\_\_\_\_ design was an absolute eyesore. Professor Raymond had, however, managed to secure approval for the building as a heritage site, making it \_\_\_\_\_ (7) \_\_\_\_\_ to demolish. He was oblivious to the \_\_\_\_\_ (8) \_\_\_\_\_ of the neighbours, as he had lived in this building for 30 years and was very comfortable here..

5. (A) endorsement  
(B) approbation  
(C) idiosyncrasy  
(D) antithesis  
(E) ordeal

The correct answer is D.

6. (A) aesthetic  
(B) obsolete  
(C) revolutionary  
(D) maverick  
(E) grandiloquent

The correct answer is B.

7. (A) ludicrous  
(B) dangerous  
(C) impossible  
(D) burdensome  
(E) paramount

The correct answer is C.

8. (A) passion  
(B) antipathy  
(C) support  
(D) hegemony  
(E) peroration

The correct answer is B.

Note that the building is being referred to as dilapidated, that is, in a very poor condition. Thus, it will be a contrast to the modern buildings around it. *Antithesis* means contrasting or opposite and should be the correct answer for Blank 1. If the building is dilapidated, its design must also then be outdated or old. So *obsolete* is the correct answer for Blank 2. If Professor Raymond had got the building approved as a heritage site, then it will be difficult or even impossible to demolish. Thus, *impossible* is the correct word for Blank 3. The meaning of *oblivious* is unmindful or ignorant of something. Thus, the use of this word hints at a contrast and since the Professor is very happy with the building, the neighbours must not be happy with this act of his. Thus, *antipathy* (which means 'dislike') should be the correct word for Blank 4.

Jane Sequeira was born in 1856. Her father was so great a \_\_\_\_\_ (9) \_\_\_\_\_, that the place of her birth is uncertain. However, she generally assumed it to be Scotland, since she had spent the first five years of her life there. While still very young, Jane \_\_\_\_\_ (10) \_\_\_\_\_ traces of exquisite sensibility, soundness of understanding, and decision of character, but owing to the domineering and conservative nature of her father, she could not develop these personality traits any further. When she turned eighteen, Jane became acquainted with Miss Beatrix Potter, who, \_\_\_\_\_ (11) \_\_\_\_\_ refined tastes and considerable knowledge of the fine arts, seems to have given the first impulse to the formation of Jane's character. Buoyed by her new-found independence, Jane left her parents' house, and \_\_\_\_\_ (12) \_\_\_\_\_ with a local community worker—Mrs. Dinshaw—for four years, when she had to return to her parental home to tend to her ailing mother.

9. (A) lunatic  
(B) historian  
(C) wanderer  
(D) merchant  
(E) warrior

Since there is no clarity on where Jane was born, her father must have *travelled* a lot. *Wanderer* fits this best.

The correct answer is C.

10. (A) repudiated  
(B) proclaimed  
(C) created  
(D) surfaced  
(E) exhibited

The correct answer should be on the lines of *displayed*. *Exhibited* fits this best.

The correct answer is E.

11. (A) possessing  
(B) surrendering  
(C) utilising  
(D) rejecting  
(E) affording

The correct answer should be on the lines of *possessing*.

The correct answer is A.

12. (A) struggled  
(B) adhered  
(C) loathed  
(D) resided  
(E) labored

The correct answer should be on the lines of *lived with*. *Resided* fits this best.

The correct answer is D.

Robert's grandfather's \_\_\_\_\_ (13) \_\_\_\_\_ for reading was also reflected in his writing. His everlasting wish was to have his book published. Having filled out the \_\_\_\_\_ (14) \_\_\_\_\_ forms at the publishing house, Robert proceeded to meet the chief editor. A \_\_\_\_\_ (15) \_\_\_\_\_ young man, Robert was, however, painfully aware of the curious glances his worn-out suit was getting. His \_\_\_\_\_ (16) \_\_\_\_\_ vision threw up motions of suppressed smiles and hastily averted eyes. He, however, ignored the unwarranted attention.

13. (A) disdain  
(B) penchant  
(C) abhorrence  
(D) insouciance  
(E) ignorance

If you read the entire passage, it becomes clear that Robert's grandfather was very good at both reading and writing. *Penchant* comes closest to this and should be the correct answer.

*Disdain*—dislike

*Abhorrence*—hatred

*Insouciance*—carefree

The correct answer is B.

14. (A) unnecessary  
(B) cumbersome  
(C) verbose  
(D) relevant  
(E) tortuous

Robert filled out the required forms or the pertinent forms. There is nothing in the passage to suggest that these forms were cumbersome, verbose, unnecessary or tortuous.

*Tortuous*—with several twists and turns

The correct answer is D.

15. (A) presentable  
(B) shabbily dressed  
(C) tawdry  
(D) poor  
(E) scholarly

The use of *however* in this sentence suggests a contrast. Since the part after *however* is talking about something negative, the part before *however* should talk about something positive. *Presentable* is the only word that makes sense in that case.

*Tawdry*—cheap

The correct answer is A.

16. (A) fading  
(B) humongous  
(C) peripheral  
(D) variegated  
(E) scornful

Robert is not directly looking at anyone, yet he is able to discern their reactions. Thus, he is assessing their reactions using his peripheral vision.

*Humongous*—huge

*Variegated*—having multiple colours

*Scorn*—contempt or disdain

The correct answer is C.

Drugs to control cholesterol have been used for more than a decade. For a long time, doctors prescribed them very (17) because of early studies that raised questions about potentially (18) effects. However, due to recent (19) research, evidence that is (20) has supported the efficacy and use of these drugs. (*Real NMAT Question*)

17. (A) leisurely  
(B) cautiously  
(C) inadvertently  
(D) clandestinely  
(E) surreptitiously

The word should mean *carefully*.

The correct answer is B.

18. (A) intense  
(B) placebo  
(C) dangerous  
(D) innocuous  
(E) speculative

The word has to mean *harmful*.

The correct answer is C.

19. (A) uncommitted  
(B) embellished  
(C) prejudiced  
(D) fabricated  
(E) promising

We need a positive word. From the options, only E is a positive word and should be the correct answer.

The correct answer is E.

20. (A) imperceptible  
(B) hypothetical  
(C) inadvertent  
(D) persuasive  
(E) axiomatic

The word should mean *strong or convincing*.

The correct answer is D.

Intuition is considered akin to perception and memory but it is (21) viewed with more scepticism than the other two. There should be enough evidence and supporting facts to reach a (22) conclusion, else it would just qualify as an opinion. The argument that our opinions are only the result of our conscious machinations is a little (23); many a child's outburst of opinion is based on impressions cast on the unconscious mind. Dream analysts have now developed new ways of (24) information that could have been locked into the recesses of the subconscious mind. (Real NMAT Question)

21. (A) often  
(B) surely  
(C) closely  
(D) clearly  
(E) myopically

The prediction for the blank should be *usually*. The best match then is *often*.

The correct answer is A.

22. (A) logical  
(B) intense  
(C) serious  
(D) complex  
(E) systematic

You always try to arrive at a *logical* conclusion.

The correct answer is A.

23. (A) creative  
(B) unnerving  
(C) theoretical  
(D) suggestive  
(E) exaggerated

The prediction should be *incorrect* or *farfetched*. The best answer, thus, is *exaggerated*.

The correct answer is E.

24. (A) storing  
(B) hacking  
(C) stealing  
(D) gathering  
(E) furnishing

The prediction for the blank should be *extracting* or *drawing out*. *Gathering* matches these best.

The correct answer is D.

## 6 Identify the Error

1. In order to lose weight, you need to both eat in small quantities as well as exercise regularly.

(A) to lose  
(B) need to  
(C) as well as  
(D) regularly  
(E) No error

'Both' always takes 'and' and not 'as well as'.

**The correct answer is C.**

2. The artist's most impressive works have been produced at his home in New York, he moved there from his native place, India.

(A) artist's most impressive  
(B) have been produced  
(C) New York, he moved there  
(D) native India  
(E) No error

Since we have two independent clauses, they cannot be connected using a comma. Use a semi colon instead.

**The correct answer is C.**

3. Cristina starting the test later than the rest of the students but was still able to complete it in the allotted time.

(A) starting the  
(B) later than  
(C) but  
(D) it  
(E) No error

The first clause of the sentence—*Cristina starting the test later than the rest of the students*—does not contain a verb whereas a verb is needed here. Starting, which is a participle, needs to be change to started, the verb.

**The correct answer is A.**

4. Most Indian students pursue their MBAs immediately after completing college, while a few working for two or three years before seeking admission.

(A) pursue their MBAs  
(B) completing college, while  
(C) working for  
(D) before seeking  
(E) No error

The second clause is missing a verb. The correct construction should be 'work for'.

**The correct answer is B.**

5. After graduating from college, his parents gave him a brand new car, ten thousand rupees and a trip around the state. (Real NMAT Question)

(A) After graduating  
(B) his parents gave him  
(C) a brand new car  
(D) around the state  
(E) No error

Note that the sentence starts with a modifying phrase—*after graduating from college*. So whoever is graduating from college should come after the comma and it definitely cannot be the parents. So the modifying phrase will have to be reworded to something like—*after he graduated from college*.....

**The correct answer is A.**

6. Priscilla and I was punished by the teacher for not completing the assignment on time.

(A) Priscilla and I  
(B) was punished  
(C) not completing  
(D) on time  
(E) No error

The plural subject *Priscilla and I* does not agree with the singular verb *was*. Thus, B is the error—the singular *was* needs to be changed to the plural *were*.

**The correct answer is B.**

7. The client that is coming for a meeting tomorrow is one of our oldest and most important clients.

(A) that is  
(B) for  
(C) is one of  
(D) most important clients  
(E) No error

The correct relative pronoun to modify 'client' is *who* and not *that*.

**The correct answer is A.**

8. The pupils loved playing cricket, gorging on fruits in the orchard and to bathe in the adjoining pond. (Real NMAT Question)

(A) loved  
(B) gorging

- (C) to bathe
- (D) adjoining
- (E) No error

Playing and gorging are parallel to *bathing* and not to bathe.

The correct answer is C.

9. Hoping to receive a permanent position, the intern put in 16 hours of work everyday.

- (A) Hoping
- (B) a permanent position
- (C) put in
- (D) everyday
- (E) No error

'Everyday' is an adjective and its use is incorrect here. We need the noun phrase 'every day' (with a space in the middle).

The correct answer is D.

10. Although Rajesh studied hard for the test, yet he could only manage a second division

- (A) studied
- (B) for the test
- (C) yet
- (D) only manage
- (E) No error

The use of *although* and *yet* in the same sentence is redundant.

The correct answer is C.

11. While some may doubt the feasibility of the proposal, it is based on empirical evidence, unlike policies that result from either fanciful suppositions or from political whims.

- (A) doubt the feasibility
- (B) it is based
- (C) unlike policies that
- (D) from political whims
- (E) No error

The sentence has an error of parallel structure. Whatever comes after *either*, the same construction has to be repeated after *or*. Since *either* is followed by a noun phrase, *or* should also do the same. Instead *or* is followed by the preposition *from*.

The correct answer is D.

12. The large and barren expanse of the Sahara desert is at once forbiddingly empty, climatically harsh, and the beauty of it is haunting.

- (A) large and barren
- (B) are at once
- (C) climatically harsh
- (D) the beauty of them is haunting
- (E) No error

In order to maintain a parallel structure, the correct phrase should be 'hauntingly beautiful'.

The correct answer is D.

13. When Amir met Tiara for the first time, he was thinking that she was very pretty.  
(Real NMAT Question)

- (A) met
- (B) for
- (C) was thinking
- (D) was
- (E) No error

Since the sentence is talking about something in the past, the correct verb has to be the simple past tense *thought*. We do not need the past progressive tense *was thinking* because the sentence is not emphasizing the ongoing nature of the activity.

The correct answer is C.

14. Jerry knows it is futile to convince his wife to buy the beach house because she is neither fond of swimming nor does she like to surf.

- (A) Jerry knows
- (B) to convince his wife
- (C) because
- (D) nor does she like to surf
- (E) No error

The preposition *of* needs to be repeated after *or* to get the parallelism correct for surfing.

The correct answer is D.

15. Always I try to be punctual. Yesterday, I fell into a ditch while on my way to school.  
(Real NMAT Question)

- (A) Always
- (B) fell
- (C) a ditch
- (D) while on my way
- (E) No error



The correct construction should be I always try to be punctual.

The correct answer is A.

16. The dormant volcano started spewing lava last year and it has been erupting sporadically ever since.

(A) started spewing  
(B) and  
(C) has been erupting  
(D) ever since  
(E) No error

The sentence is correct as written.

The correct answer is E.

17. Sharks are a type of fish with a full cartilaginous skeleton and a highly streamline body.  
(Real NMAT Question)

(A) are  
(B) fish  
(C) full  
(D) streamline  
(E) No error

You need the participle *streamlined* to modify the noun body.

The correct answer is D.

18. In this store, we sell items sourced from not only Asia but also from the Central and Latin Americas.

(A) items sourced  
(B) not only Asia  
(C) from  
(D) Central and Latin Americas  
(E) No error

Since there is no from after 'not only', we do not need to repeat it after 'but also'.

The correct answer is C.

19. The latest spacecraft sent by ISRO attempts to take high resolution photographs of the surface of Neptune, understand the characteristics of the atmosphere of the planet, and to search for evidence of life. (Real NMAT Question)

(A) spacecraft sent by  
(B) attempts to take  
(C) of the surface of  
(D) to search for

(E) No error

Take and understand will be parallel to search and not 'to search'.

The correct answer is D.

20. The items served in my restaurant are far more diverse and delicious than your restaurant.

(A) served in  
(B) are far more  
(C) and delicious  
(D) your restaurant  
(E) No error

The correct comparison should be than those served in your restaurant.

The correct answer is D.

21. According to leading economists across the world, rising inflation is one of the factors that seem to indicate that an economy might be headed for a recession.

(A) across the world  
(B) rising inflation is  
(C) that seem to indicate  
(D) might be headed  
(E) No error

There is no error in the sentence. The plural subject factors correctly agrees with the plural verb seem. Seem to is also the correct idiomatic construction.

The correct answer is E.

22. In this museum, there is a large number of artefacts from every historical period, going as far back as the time of the ancient Greek.

(A) there is  
(B) of artefacts from  
(C) period, going  
(D) as  
(E) No error

The correct verb to refer to a large number of artefacts should be the plural are.

The correct answer is A.

23. When enquired as to which course he would prefer to take, Laksh replied that either of the two courses was fine with him.

(A) as to which  
(B) would prefer  
(C) replied that  
(D) was fine  
(E) No error

The sentence is correct as written.

The correct answer is E.

24. The Netherlands have proved their mettle in this year's Euro Cup as a progressive football playing nation. (Real NMAT Question)

(A) have  
(B) mettle  
(C) year's  
(D) football playing nation  
(E) No error

The Netherlands is a single entity, and hence the verb used has to be has.

The correct answer is A.

## 7 Choose the Correct Preposition

1. i. Krishna said that he would arrive \_\_\_\_\_ 2 and 3 pm.  
ii. In the newly constructed shopping mall the shops stay open \_\_\_\_\_ 11 am to 11 pm.  
iii. The formalities are all over and the rocket is ready for launch \_\_\_\_\_ 30 minutes.  
(a) at  
(b) from  
(c) on  
(d) in  
(e) between  
(f) for

(A) bde

(B) cdb

(C) ebd

(D) eca

(E) dbc

Krishna said that he would arrive *between* 2 and 3 pm.

In the newly constructed shopping mall the shops stay open *from* 11 am to 11 pm.

The formalities are all over and the rocket is ready for launch *in* 30 minutes.

The correct answer is C.

2. i. We walked \_\_\_\_\_ the river bank until we found our clothes.  
ii. Jaggu was accused \_\_\_\_\_ cheating in the exam.  
iii. The MD apologised \_\_\_\_\_ the CEOs poor behaviour.  
(a) in  
(b) along  
(c) of  
(d) to  
(e) for  
(f) by

(A) bce

(B) cbe

(C) ecd

(D) dce

(E) fce

You walk *along* the river bank.

You are accused *of* something.

You apologise *for* something.

The correct answer is A.

3. i. The manager told his staff that he would arrive \_\_\_\_\_ 3:00 and 4:00 pm.  
ii. The army will be ready to attack \_\_\_\_\_ 40 minutes.  
iii. Varun cancelled the movie plan, saying he wanted to stay \_\_\_\_\_ home instead.  
(a) until  
(b) in  
(c) for  
(d) at  
(e) within  
(f) between

(A) bfd

(B) fdb

(C) ace

(D) fbd

(E) fec

You arrive *between* X and Y time.

You will attack *in* 40 minutes

You want to stay *at* home.

The correct answer is D.

## 4. (Real NMAT Question)

- i. After injuring the old man, the criminals abandoned him to his fate and escaped \_\_\_\_\_ his money.  
ii. No one \_\_\_\_\_ the committee is in favour of selecting him as chairman for the second consecutive term.  
iii. Have some guards stand \_\_\_\_\_ in case we get into trouble and need help.  
(a) on  
(b) along  
(c) with  
(d) in  
(e) from  
(f) by

(A) aeb

(B) bde

(C) bec

(D) caf

(E) ede

You escape *with* something.  
 You are *on* a committee.  
 You have people standing *by* to help you.

The correct answer is D.

5. i. The shops in the central shopping district are open \_\_\_\_\_ Monday to Saturday.  
 ii. I watched the football match \_\_\_\_\_ the television last night.  
 iii. I will reach the office \_\_\_\_\_ 10:00 am.  
 (a) by  
 (b) through  
 (c) from  
 (d) in  
 (e) for  
 (f) on

- (A) cfa  
 (B) bde  
 (C) fca  
 (D) caf  
 (E) ebf

Something is open *from* Monday to Saturday.  
 You watch something *on* the television.  
 You will reach somewhere *by/at* a particular time.  
 (Since *at* is not in the options, we will go with *by*).

The correct answer is A.

6. (Real NMAT Question)

- i. 26th January is celebrated \_\_\_\_\_ great enthusiasm and festivity.  
 ii. The colourful parade starts \_\_\_\_\_ Vijay Chowk and ends at the Red Fort.  
 iii. Everybody walked \_\_\_\_\_ the route to view the march past.  
 (a) amid  
 (b) with  
 (c) from  
 (d) upon  
 (e) over  
 (f) along

- (A) afe  
 (B) bcf  
 (C) fab

- (D) cda  
 (E) bfd

You celebrate something *with* enthusiasm.  
 Something starts *from* a particular place.  
 You walk *along* a route.

The correct answer is B.

7. (Real NMAT Question)

- i. What seemed like difficult and hectic lectures turned out to be useful and instrumental lessons \_\_\_\_\_ effective personal development.  
 ii. Even though my teacher was a patient lady, she was quite strict \_\_\_\_\_ students who were irresponsible and undisciplined.  
 iii. While Jack scored average marks in most of his subject tests, he was, \_\_\_\_\_ a long way, ahead of his peers when it came to general knowledge.  
 (a) against  
 (b) towards  
 (c) of  
 (d) along  
 (e) with  
 (f) by

- (A) bac  
 (B) bef  
 (C) dce  
 (D) ecb  
 (E) fda

You can work *towards* effective development.  
 You are strict *with* someone.  
 You are ahead *by* a long way.

The correct answer is B.

8. i. The actor responded to the director's demand \_\_\_\_\_ throwing a tantrum.  
 ii. Since the CEO was not in, the MD had to fill in \_\_\_\_\_ him at the Board meeting.  
 iii. What are the primary requirements \_\_\_\_\_ this approach?  
 (a) of  
 (b) for  
 (c) in  
 (d) from

- (e) by
- (f) to
- (A) abe
- (B) bea
- (C) fba
- (D) cba
- (E) eba

You respond *by* doing something.

You fill *in* for someone.

X is the requirement *of* something.

**The correct answer is E.**

**9. (Real NMAT Question)**

- i. Parents these days are extremely motivated to send their children \_\_\_\_\_ physical training in order to combat obesity.
  - ii. Education plays a vital role \_\_\_\_\_ the upliftment of the masses.
  - iii. Children should get the space \_\_\_\_\_ criticise and change their inherited worlds.
    - (a) in
    - (b) to
    - (c) for
    - (d) into
    - (e) unto
    - (f) through
- (A) bce
  - (B) cab
  - (C) adc
  - (D) cba
  - (E) dcb

You send your children *for* something.

Education plays a role *in* something.

Children should get the space *to* do something.

**The correct answer is B.**

- 10.**
- i. It has been raining in Mumbai \_\_\_\_\_ Wednesday morning.
  - ii. Kamal was fined by the traffic police for driving \_\_\_\_\_ 120 kmph.
  - iii. People often listen to music \_\_\_\_\_ their way to the office.
    - (a) for
    - (b) from
    - (c) since

- (d) in
- (e) at
- (f) on
- (A) bee
- (B) bea
- (C) dcf
- (D) cef
- (E) ecf

Something has been happening *since* a particular time.

You drive *at* a particular speed.

You are *on* your way to office.

**The correct answer is D.**

- 11.**
- i. The administration's new proposals have been met \_\_\_\_\_ a lot of opposition from the citizens of the town.
  - ii. The children are so excited to eat out that they are unable to choose between a pizza \_\_\_\_\_ a burger.
  - iii. When asked to come to the party, Ramesh declined saying that he had decided to stay \_\_\_\_\_ home and study instead.
    - (a) with
    - (b) or
    - (c) and
    - (d) for
    - (e) in
    - (f) at
- (A) acf
  - (B) cbe
  - (C) abf
  - (D) dbe
  - (E) abe

The administration's new proposals have been met *with* a lot of opposition from the citizens of the town.

The children are so excited to eat out that they are unable to choose between a pizza *and* a burger.

When asked to come to the party, Ramesh declined saying that he had decided to stay *at* home and study instead.

**The correct answer is A.**

## 12. (Real NMAT Question)

- i. I was \_\_\_\_\_ the house and this is what I saw.
  - ii. He was pouring water \_\_\_\_\_ the glass when it fell from his hand.
  - iii. She took her shoes \_\_\_\_\_ and walked barefoot on the grass.
- (a) in
  - (b) at
  - (c) into
  - (d) onto
  - (e) off
  - (f) of

- (A) bca
- (B) aae
- (C) bdf
- (D) cdf
- (E) ace

You are *in* or *at* the house.

You pour water *into* something.

You take *off* your shoes.

The correct answer is E.

13. i. The work fell \_\_\_\_\_ schedule because of the sudden departure of the Managing Director.
  - ii. I am tired \_\_\_\_\_ doing nothing all day but wasting my time.
  - iii. The young man got himself a dog \_\_\_\_\_ company.
- (a) of
  - (b) behind
  - (c) to
  - (d) in
  - (e) for
  - (f) from

- (A) feb
- (B) cfa
- (C) abe
- (D) eba
- (E) bae

Something falls *behind* schedule.

You are tired *of* something.

You get someone *for* company.

The correct answer is E.

14. i. The life guard told the swimmers to watch \_\_\_\_\_ for sharks.
  - ii. On meeting Tanveer after a gap of five years, Anil enquires what he was up \_\_\_\_\_
  - iii. My boss is extremely rude and I do not get \_\_\_\_\_ with him at all.
- (a) with
  - (b) out
  - (c) from
  - (d) to
  - (e) by
  - (f) along

- (A) edf
- (B) bdf
- (C) bae
- (D) fed
- (E) dfe

You watch out *for* something.

You enquire what someone is up *to*.

You do not get *along* with someone.

The correct answer is B.

## 15. (Real NMAT Question)

- i. The department has always faced criticism \_\_\_\_\_ its poor services.
  - ii. Anxious parents lined up for hours together \_\_\_\_\_ the school waiting for their children.
  - iii. Taking cognizance \_\_\_\_\_ the fire, the department has marked a probe into the incident.
- (a) of
  - (b) for
  - (c) from
  - (d) aside
  - (e) outside
  - (f) besides

- (A) bcf
- (B) acf
- (C) dfc
- (D) bea
- (E) bad

You face criticism *for* something.

You line up *outside* some place.

You take cognizance of something.

The correct answer is D.

**16. (Real NMAT Question)**

- i. Threatening \_\_\_\_\_ sue the authorities, she said that she was seeking legal opinion.
- ii. After years \_\_\_\_\_ struggle, she earned favourable conditions at her workplace.
- iii. Health care programmes aimed \_\_\_\_\_ providing treatment to the under-privileged children.
  - (a) at
  - (b) of
  - (c) to
  - (d) into
  - (e) from
  - (f) around

- (A) cba
- (B) ade
- (C) cbe
- (D) bda
- (E) acb

You threaten to do something.

You spend years of struggle.

You aim at something.

The correct answer is A.

- 17.**
- i. My father works \_\_\_\_\_ a security officer in a hotel.
  - ii. Kavita told her friend that she was not good \_\_\_\_\_ cooking.
  - iii. Since the doctor is not in, the nurse is taking care \_\_\_\_\_ us at the moment.
    - (a) at
    - (b) with
    - (c) for
    - (d) as
    - (e) of
    - (f) by

- (A) dea
- (B) ade
- (C) dae
- (D) bfa
- (E) cbf

You work as something.

You are good or bad at something.

You take care of someone.

The correct answer is C.

**18. (Real NMAT Question)**

- i. The room was adequate \_\_\_\_\_ our needs.
- ii. The speaker deviated \_\_\_\_\_ the topic.
- iii. The youth embarked \_\_\_\_\_ an adventure.
  - (a) on
  - (b) by
  - (c) at
  - (d) for
  - (e) from
  - (f) in

- (A) bea
- (B) cab
- (C) dea
- (D) dfa
- (E) fbd

Something is adequate for our needs.

You deviate from something.

You embark on something.

The correct answer is C.

## 19. (Real NMAT Question)

- i. The mayor could not be entrusted \_\_\_\_\_ handling sensitive religious issues in the wake of his inability to take action to stop the recent communal tension in the city.
- ii. It is even suspected that he might have colluded \_\_\_\_\_ the communal leaders of some political organisations representing the majority community to incite violence against the minority community.
- iii. The media too has charged that police officials abstained from taking action against rioters \_\_\_\_\_ his behest.

- (a) at  
(b) on  
(c) upon  
(d) with  
(e) of  
(f) for

- (A) dfb  
(B) dda  
(C) ddc  
(D) fda  
(E) efa

You are entrusted *with* something.

You collude *with* someone.

You work *at* someone's behest.

The correct answer is B.



## 8 Reading Comprehension

### Passage 1

**Topic**—Women being acknowledged only for their appearance.

**Scope**—How women have unwittingly contributed to men's focus on their appearance to the neglect of other facets of their personality.

### Passage Map

**P 1**—Introduces the author's dislike about the fact that men are obsessed only with women's looks and women fall prey to this empty flattery.

**P 2**—Accepts that there are some aspects in which men are superior but that does not warrant their treating women merely as objects of allure.

1. The primary purpose of the passage is to:
  - (A) question male writers for not focusing on the issues of women in their literary works.
  - (B) reconcile two contrasting opinions about the role of women in our society.
  - (C) describe how parents and schools are making women weak by encouraging them to focus only on superficial beauty.
  - (D) argue that women are meant to and should be encouraged to serve a higher purpose in society than just look attractive.
  - (E) propose a restructuring of the roles of women in society by shifting the focus from attractiveness to more noble ambitions.

The primary purpose question can only be answered correctly if you have understood the passage properly. In the passage, the author is making the point that women have been conditioned by society to focus only on looking attractive. However, the author argues that women should cherish much nobler ambitions than just looking attractive. Option D summarises this best and should be the correct answer. In a primary purpose question, you should use the first word of every option to eliminate some options. For example, Options B and E are immediately out because the author is not trying

to reconcile or propose something. Option A is not within the scope of the passage and can be eliminated. Option C is mentioned in the passage but it is not the main purpose of the entire passage.

The correct answer is D.

2. According to the passage, who among the following is responsible for the current state of women in the society?
  - i. The parents of women
  - ii. The women themselves
  - iii. Books by some male writers
  - (A) i only
  - (B) ii only
  - (C) ii and iii only
  - (D) i and iii only
  - (E) i, ii and iii only

The passage clearly mentions option iii in the first paragraph. However, the author also asserts that women themselves have been swayed by men's focus on their beauty, and have started focusing more on looking attractive than on fulfilling a more noble purpose. Thus, options ii and iii are correct.

The correct answer is C.

3. What is the meaning of 'specious', as used in the passage?
  - (A) large
  - (B) deceptive
  - (C) accommodating
  - (D) unconvincing
  - (E) malicious

The best word that can stand in place of specious is misleading or false. Deceptive fits this best.

The correct answer is B.

4. Which of the following assertions would the author of the passage most likely agree with?

- i. Men are physically superior to women.
- ii. Women enjoy the attention lavished on them by men.
- iii. Women should rebel against the injustices meted out to them by men.

- (A) i only
- (B) iii only
- (C) ii and iii only
- (D) i and ii only
- (E) i, ii and iii only

The author clearly agrees in the second paragraph that men are physically superior to women. Thus, option i is correct. The author also mentions towards the end of the first paragraph that women get intoxicated by the attention they get from men. Thus, Option ii is also correct. Option iii is not mentioned or implied anywhere in the passage.

The correct answer is D.

## Passage 2

**Topic** – Mother's cooking

**Scope** – What was so special about mother's cooking

### Passage Map

**P1** – Asks the question – what made mother's dishes so special.

**P2** – Describes features of mother's garden.

**P3** – Describes the herbs that played a major role in mother's cooking.

1. The author compares *herbs* in mother's garden with members of 'the cast' primarily in order to:
  - (A) describe the supporting role played by these herbs in preparing a dish.
  - (B) identify a similarity between these herbs and other fruits and vegetables.
  - (C) analyse the relationship between herbs and cooking.
  - (D) explain how these herbs play a vital role in providing flavour to a dish.
  - (E) point out the key differentiating ingredients in mother's dishes.

Note that the question is asking you specifically why the herbs are being compared with members of the cast. Thus, options such as E, which could be correct, based on the information in the passage but which do not address this comparison can be eliminated. You should be able to then narrow down to options A and D—the difference between the two being whether the herbs are playing a supporting role or a major role. This is where the author mentions other members of the cast as these members play what appear to be minor roles but leave a lasting impact in the minds of the audiences. Similarly, it may appear that herbs are playing a supporting role in a dish but they are actually playing a vital role because it is the flavour of these herbs that will be remembered long after the other 'supposedly' major ingredients have been forgotten.

**The correct answer is D.**

2. According to the passage, which of the following could be a reason we are attracted towards the dishes made by our mothers?
  - (A) They were made using ingredients that are not available today.

- (B) They satisfied our hunger much better than modern dishes do.
  - (C) They did not involve the use of artificial flavours.
  - (D) They serve as reminders of our younger selves.
  - (E) They were made from home grown vegetables.
- The answer can be found in the sentence - connected to other pleasant memories of our younger selves

**The correct answer is D.**

3. According to the passage, which of the following was a unique feature of mother's garden?
  - (A) The availability of rare herbs and vegetables.
  - (B) The use of sweet herbs.
  - (C) The addition of mother's love.
  - (D) The effort that went into preparing the dishes.
  - (E) The neat and organised layout.

The answer can be found in the line - there was nothing remarkable about it, at least at first glance. What did stand out was that everything—flowers, fruits and vegetables—was neatly laid out and pleasing to the eye.

**The correct answer is E.**

4. From the information in the passage, which of the following is not true of the herbs discussed in the last paragraph of the passage?
  - (A) They tasted sweet.
  - (B) Their memory lingered long after the food was eaten.
  - (C) They were usually not the main ingredient of a dish.
  - (D) They added flavour to a dish.
  - (E) They were not laid out on the dining table.

While the passage refers to the herbs as 'sweet herbs' in one sentence, this does not imply that the herbs actually tasted sweet. Note the use of inverted commas around this phrase. The idea was to imply how important these herbs were in mother's cooking.

**The correct answer is A.**

### Passage 3

**Topic**—What triggers human emotions

**Scope**—To explore the relationship between impulses and release of certain emotions

### Passage Map

P 1—states that certain emotions are accompanied by the release of hormones and these emotions cannot be controlled by humans.

P 2—explains how the understanding of impulse triggers and impulse control can help curb sudden emotional outbursts.

1. According to the passage, in which of the following hypothetical cases would a person be able to consciously control his or her emotions?

- i. If a person becomes angry at the slightest of provocations but no hormone is released.
- ii. If a person consumes a recently developed drug that greatly increases the rate of dissipation of hormones in the human body.

- iii. If a person is taking a medication that prevents the release of adrenaline in the human body.

(A) ii and iii only

(B) i and ii only

(C) iii only

(D) ii only

(E) i, ii and iii

The passage states that the reason a person is not able to voluntarily control emotions is that these emotions are sustained by hormones whose rate of dissipation cannot be controlled by humans. Thus, if no such hormones were released, there would be no problem in the first place. So, i is correct. Option ii is also correct because by consuming this drug, a person can increase the rate of dissipation of hormones, something he had no control upon earlier. Option iii is incorrect because it specifically talks about adrenaline. Even if adrenaline is not produced, some other hormone could be produced upon whose dissipation rate a person would have no control.

The correct answer is B.

2. According to the passage, a rational person differs from a highly impulsive person in that:

- (A) a rational person's body produces a controllable amount of hormones.
- (B) a rational person is able to better control his judgment of events.
- (C) a rational person does not let his hormones affect his emotions.
- (D) a rational person does not allow emotions to bypass his conscious mind.
- (E) a rational person has no less a tendency to jump to conclusions.

The second paragraph starts by stating that a rational and a highly impulsive person may perceive the same event differently. Thus, B should be the answer. Options A and C are incorrect because, as the first paragraph clearly states, a person cannot consciously control the release or dissipation of his hormones. Option D is a distortion of facts in the first paragraph. Option E is the opposite of what the passage states.

The correct answer is B.

3. What is the meaning of the word 'misconstrue' as used in the passage (paragraph two)?

- (A) Mislead
- (B) Misdemeanor
- (C) Misguide
- (D) Misinterpret
- (E) Misrepresent

The best word for the answer should be *misunderstand*. Option D fits this best.

The correct answer is D.

4. Why does the author use the term 'unfortunately' in the second sentence of the passage?
- (A) To underscore the inherent sorrow that a person who is unable to contain his emotions, faces.
  - (B) To provide a contrast with the previous sentence by stating that in some cases a person may not be able to voluntarily control his emotions in the first place.
  - (C) To assert that a person not being able to contain his emotions is not the desired state of affairs.
  - (D) To conclude that all the efforts of researchers have gone in vain because there is actually a connection between hormones and emotions.
  - (E) To arrive at a conclusion about the relationship between hormones and emotions later in the passage.

To answer this question correctly, you will need to read the previous sentence of the passage as well, because the word 'unfortunately' provides a transition from this sentence. The previous sentence talks about better emotional control. The next sentence then mentions that, unfortunately, in several cases a human cannot have conscious control over his emotions. Thus, B is the best answer.

The correct answer is B.

**Passage 4 (Real NMAT Passage and Questions)****Topic**—Heuristics**Scope**—What are heuristics and how different heuristics apply to different situations.**Passage Map****P 1**—To provide an introduction to heuristics.**P 2**—To discuss the difference between heuristics and algorithm.**P 3**—Example of a heuristic.**P 4**—Example of a second heuristic.**P 5**—Example of a third heuristic.**1.** What is the central idea of the passage?

- (A) Using heuristics has positive and negative results.
- (B) Qualitative differences exist among kinds of heuristics.
- (C) There is a difference between the use of algorithms and heuristics.
- (D) There are various kinds of heuristics with differences among them.
- (E) What is heuristics, its types, usefulness, appropriateness and judicious application.

Option E best summarises the entire content of the passage. While some of the other options also mention points contained in the passage, only E mentions all of them and should be the correct answer.

**The correct answer is E.****2.** According to the passage, one of the major drawbacks of heuristics is that:

- (A) they cannot provide a reliable solution.
- (B) diagrams have to be drawn to find solutions to problems.
- (C) they are of no use when it comes to classification of plants.
- (D) they have to be chosen according to the situation and often lack accuracy and reliability.
- (E) they are a golden rule of problem-solving, but they do not prove useful in all situations.

The correct answer is contained in Para 2, which states that heuristics will not always lead to a correct solution. E states this best and should be the correct answer.

**The correct answer is E.****3.** According to the author, what can be concluded from the passage?

- (A) Heuristics may or may not be situation-specific.
- (B) The use of heuristics provides a sure fire solution to any given problem.
- (C) Algorithms and heuristics do not differ much in terms of reliability and speed.
- (D) Heuristics help in ruling out other possibilities and thus provide a direct solution.
- (E) Appropriate use and choice of heuristics in a particular situation can help solve problems.

The passage talks about different types of heuristics and how different heuristics can be used in different situations.

**The correct answer is E.****4.** According to the passage, the author most likely agrees with all of the following statements EXCEPT:

- (A) any kind of heuristics will fit any situation.
- (B) heuristics are faster than using an algorithm.
- (C) breaking a goal into sub-goals makes it easy.
- (D) heuristics may involve making diagrams to arrive at the final goal.
- (E) representative heuristics can be used or misused for creating stereotypes.

The passage clearly states that heuristics are situation specific and you need different ones for different situations. Thus, the author will never agree with A, the correct answer.

**The correct answer is A.**

## Passage 5

**Topic**—Grants by charitable foundations

**Scope**—How charitable foundations keep a check on the grants they make to beneficiaries

### Passage Map

**P 1**—introduces the three stages in which charitable organisations keep a check on the use of their grants by beneficiaries.

**P 2**—explains the first stage and how the charitable organisation exercises control at this stage.

**P 3**—explains the second stage and how the charitable organisation exercises control at this stage.

**P 4**—explains the third stage and how the charitable organisation exercises control at this stage.

1. What is the primary purpose of the passage?
  - (A) To describe why it is imperative for charitable foundations to keep a track of the activities of the beneficiaries they have funded.
  - (B) To argue for the creation of more standardised contracts between charitable foundations and their beneficiaries.
  - (C) To explain and support the proactive role certain charitable organisations play in the activities of their beneficiaries.
  - (D) To discuss the different ways in which charitable foundations can control the misuse of their funds by the beneficiaries.
  - (E) To provide an explanation for the seemingly overbearing behaviour of charitable organisations towards their beneficiaries.

The passage is clearly concerned with highlighting three different ways in which charitable foundations try to prevent or control the misuse of their funds by the beneficiaries of these funds. Thus, D is the correct answer. In case you are confused about option A, note that the passage is not concerned with why it is imperative or important for charitable organisations to act in this manner. Rather, the passage focuses on how charitable organisations go about imposing this control.

**The correct answer is D.**

2. According to the passage, each of the following is a method used by charitable foundations to control the use of their funds EXCEPT:
  - (A) making the grant of funds dependent on the fulfillment of certain obligations and deliverables on the part of the beneficiary.
  - (B) explicitly detailing the types of expenditure that they will reimburse or not reimburse.
  - (C) prohibiting certain types of beneficiaries from applying for their funds.
  - (D) acting as mentors to their beneficiaries and guiding them in making appropriate use of the funds.
  - (E) giving out the total amount of the grant in a staggered manner.

Remember that this is an EXCEPT question, so four of the options will be mentioned in the passage and the one that is not mentioned will be your answer. Options B and E are mentioned in the 3<sup>rd</sup> paragraph. Option C is mentioned in the 2<sup>nd</sup> paragraph. Option A is mentioned in the last paragraph. In option D, note that the passage never states that charitable organisations act as mentors to their beneficiaries. They can act as or appoint monitors, but mentors not mentioned anywhere in the passage.

**The correct answer is D.**

3. According to the various criteria mentioned in the passage, which of the following entities will most probably not be funded by a charitable organisation?
  - i. An entity that requires the entire amount of the grant to be paid upfront.
  - ii. An entity that plans to undertake an activity prohibited by the charitable organisation.
  - iii. An entity that refuses to follow the subsequent instructions of the charitable organisation arising over the course of its operations.
  - (A) ii only
  - (B) iii only
  - (C) ii and iii only
  - (D) i, ii and iii
  - (E) i and ii only

Notice that the question is asking you which of these entities will *not* be funded by a charitable organisations. While Options i and ii are clearly implied in the passage, option iii is incorrect because whatever instructions or requirements a charitable organisation has need to be mentioned in the agreement up front. The beneficiary is not obliged to follow any instructions that the charitable organisations may come up with later on.

The correct answer is E.

4. What is the meaning of the term 'discretion' as used in the 3<sup>rd</sup> paragraph of the passage?
- (A) secrecy  
(B) responsibility  
(C) authority  
(D) credibility  
(E) gullibility

The correct answer should be on the lines of *control*. Authority fits this best.

The correct answer is C.



## Passage 6

**Topic**—The *Guinness Book of World Records*

**Scope**—The beginning of record taking and how the nature of records has changed over the years with reference to the *Guinness Book*

### Passage Map

**P 1**—To provide an introduction to the *Guinness Book*.

**P 2**—To discuss the approach of the initial record collectors (with reference to the *Guinness Book*).

**P 3**—To discuss the *Guinness Book* in its current form and how the nature of records contained in it has changed from its earlier forms.

**P 4**—To provide a conclusion by stating a possible useful role of the *Guinness Book* in the future.

1. What is the main purpose of the author in writing the passage?
  - (A) To discuss the origins of the *Guinness Book* and its evolution over the years.
  - (B) To criticise the fact that the *Guinness Book*, in its current form, stresses more on entertainment than on education.
  - (C) To explain the origin of the *Guinness Book*.
  - (D) To analyse what makes the *Guinness Book* the largest selling book in the world.
  - (E) To discuss how the *Guinness Book* originated and to advocate against the commercialisation of the book in its current form.

The author clearly has a neutral-to-positive tone in the passage, so all the options that contain negative terms, such as 'criticise', can be eliminated. The passage starts by discussing the origins of the *Guinness Book* and goes on to discuss the changes that have come about in the book as it has evolved over the years. Note that the last paragraph ends on a positive note, further reinforcing the decision to eliminate all options with negative connotations. (A) conveys the main idea of the passage best and is the correct answer.

- (B) The author never criticises anything in the passage.
- (C) The author does much more than just explain origin of the book.
- (D) While the passage does mention this fact in passing, this is not why the author wrote the entire passage.
- (E) The first part of this option about the origin of the book is correct, but the second part which states that the author advocates against something is obviously incorrect.

The correct answer is A.

2. Which of the following is mentioned in the passage as a record contained in the *Guinness Book*?
  - (A) The world's largest combustion engine.
  - (B) The world's longest train.
  - (C) The world's heaviest train.
  - (D) The world's widest mouth.
  - (E) The world's strongest beard.

While all the options contain elements mentioned in the passage, most of them distort these elements. (B) states what is stated in the passage verbatim and is the correct answer.

- (A) The record is for the world's most powerful (and not the largest) combustion system.
- (C) Incomplete. The record is for the world's heaviest train to be pulled with a beard.
- (D) The passage never states that this record is actually there in the *Guinness Book*; it only states that the likelihood of this fact being in the book is high.
- (E) Distortion. The record is for the world's heaviest train to be pulled by a beard and not for the world's strongest beard.

The correct answer is B.

3. According to the author, how is the current version of the *Guinness Book* different from its older versions in terms of content?

- (A) The book is now available on the Internet.
- (B) The book now contains entertainment-oriented facts along with educational ones.
- (C) The book now offers insight into the full spectrum of life.
- (D) The focus of the book has shifted from providing education to providing entertainment.
- (E) The *Guinness Book* offers a telling glimpse into the future of fact finding and record recording.

The author clearly states in the second paragraph that, in the current version of the book, entertainment-oriented records share space with education-oriented ones. (B) states this best and is the correct answer.

- (A) While this is true, the difference has to be in the content and not in the presentation.
- (C) While this is also true, this is not necessarily a point of difference between the two versions of the book, as this was probably true for the older version as well.
- (D) The author never states that the focus of the book has shifted; he merely states that the book now also contains entertainment-oriented facts.
- (E) Same as (C).

The correct answer is B.

## Passage 7

**Topic**—Realpolitik

**Scope**—To explore Machiavelli's concept of politics without principles

### Passage Map

**P 1**—Introduces the term 'realpolitik'—politics without principles.

**P 2**—Provides an example of how Machiavellian principles have been practiced from even before his time.

**P 3**—Provides Machiavelli's description of a strong person.

**P 4**—States that Machiavellian wasn't particularly bothered about good governance.

**P 5**—Provides Machiavelli's distinction between power and glory.

1. Which of the following can be inferred from the passage about most political theory in the Classical era?
  - (A) It was not favoured by several important men of that time.
  - (B) It was considered mild and less aggressive in comparison to other political theories of that time.
  - (C) It was rooted more in practicality than in principles.
  - (D) It was eventually abandoned in favour of realpolitik countries.
  - (E) At least some of its tenets were not rooted in practicality.

The opening sentence of the passage states that realpolitik was more shrewd and pragmatic (practical) than the Classical political theory. Thus, it can be concluded that at least some of the tenets of the Classical theory were not rooted in practicality. Options A and B are not stated anywhere in the passage. Option C is true of realpolitik and not of the Classical theory. There's nothing in the passage to suggest that the Classical theory was eventually abandoned.

**The correct answer is E.**

2. Why does the author mention Chapter XII in the passage?
  - (A) To explain that Machiavelli never actually described what were the characteristics of a good law.
  - (B) To show that Machiavelli considered arms superior to laws.
  - (C) To highlight the low level of importance Machiavelli assigned to the presence of good laws in a state.
  - (D) To prove that good governance never formed a part of Machiavelli's teachings.
  - (E) To explain how Machiavelli was only concerned with the presence of laws, not with their quality.

Note that in these questions you have to answer specifically for Chapter XII and not for the entire paragraph in general. The passage mentions Chapter XII to highlight the fact that it took Machiavelli 11 chapters to talk about arms and army before he mentioned good laws for the first time. This shows how unimportant good laws were in Machiavelli's scheme of things.

**The correct answer is C.**

3. Which of the following assertions would Machiavelli most likely agree with?
  - i. There is nothing wrong in showing contempt towards those who have lost in battle.
  - ii. The king should perform only two functions—fight good wars and make good laws.
  - iii. A ruler who committed atrocities would still gain glory as long as he won wars.
  - (A) i only
  - (B) iii only
  - (C) i and iii only
  - (D) ii and iii only
  - (E) i and ii only

Option i is clearly supported by information in the 3<sup>rd</sup> paragraph of the passage. Option ii is incorrect because, as Paragraph 4 states, Machiavelli pays little importance to the presence of good laws. In the last sentence of the passage, Machiavelli states that the Prince would not win glory because of the countless atrocities he had committed. Thus, iii is incorrect as well.

**The correct answer is A.**

4. Which of the following is a point of similarity between Sorolla and Machiavelli?
- (A) Both of them believed in the supreme position of the emperor.
  - (B) Both of them believed that victory in a war was paramount, no matter at what cost it came.
  - (C) Both of them believed that maintaining a strong and able army was more important than making good laws.
  - (D) Both of them believed that it was acceptable to go to any lengths in the single minded pursuit of one's goal.
  - (E) Both of them were a creation of the initial monopoly of the Classical political theory.

Note that Sorolla believed in maintaining the absolute supremacy of the king whereas Machiavelli believed that wars needed to be won at any cost. Thus, options A, B and C can be eliminated. Option E is not mentioned or implied anywhere in the passage. Option D is the correct answer because both Sorolla and Machiavelli believed in going to any lengths to maintain the supremacy of the king and win wars respectively.

The correct answer is D.

## Passage 8

**Topic**—Close synonyms

**Scope**—The use of close synonyms interchangeably and the subtle differences in mood or feeling conveyed by them

### Passage Map

**P 1**—To state that it is important for some people to understand the subtle differences of meaning between close synonyms.

**P 2**—To explain that there is a difference of mood conveyed by close synonyms which cannot be explained by a dictionary.

**P 3**—To state that it is up to the users of English language to ensure that the subtle differences of mood conveyed by close synonyms are passed down through generations.

1. The author of the passage is most likely to agree with which of the following?
  - (A) Two words can never be complete synonyms.
  - (B) The dictionary does not contain all the meanings of a word.
  - (C) The English language is inherently superfluous.
  - (D) Two words can never be used interchangeably.
  - (E) It is pedantic to quibble over the difference in meaning between two close synonyms.

The author clearly states in the second paragraph that there is no point in having multiple words with the same meaning. He goes on to conclude later in the passage that even if two words have the same meaning, they convey different feelings. Thus, he would most likely agree with (A) that two words can never be complete synonyms; there will always be some small difference between the two.

- (B) The author never states that the dictionary does not contain all the meanings of a word, but that it cannot convey the feelings attached to a word, which are more subjective.
- (C) Opposite. The author, in fact, states that the English language is very economical.
- (D) Extreme option. There may be two words that can be used interchangeably, even if they convey different feelings.
- (E) The author states at the end of the first paragraph that he belongs to the opposite group for whom such differences have significant value.

**The correct answer is A.**

2. What is the primary purpose of the passage?
  - (A) To explain the limitations of the dictionary.
  - (B) To highlight the importance of users of the English language in conveying the feelings and moods attached to a word.
  - (C) To prove why two words can never be exact synonyms.
  - (D) To discuss the importance of subtle feelings and moods attached to words having similar meanings.
  - (E) To criticise those who believe that synonyms can always be used interchangeably.

The author's underlying theme in the passage is that even if two words have the same meaning, the feeling or mood conveyed by them could be different. He concludes the passage by stating that users of English language play a very important role in sustaining this 'feeling' or 'mood' attached to a word. (D) captures this best and is the correct answer.

- (A) While the author does mention this, this is not the main purpose of the entire passage.
- (B) Again, the author mentions this in the last paragraph but he did not dedicate the entire passage to discussing this fact.
- (C) The author does not prove anything in the passage.
- (E) The author never criticises anyone in the passage.

**The correct answer is D.**

3. According to the passage, each of the following is true of a dictionary, EXCEPT:
  - (A) It can help pronounce words correctly.
  - (B) It provides information about the origin of words.
  - (C) It does not communicate the feeling or mood attached to a word.
  - (D) It provides all the meanings of a word.
  - (E) It helps choose which word to use from amongst closely related synonyms.

In the third paragraph, the author states that the dictionary is of little use in deciding, out of two close synonyms, which one conveys the feeling and mood effectively. Thus (E) is the best answer.

- (A) This is mentioned at the end of the second paragraph.
- (B) This is also mentioned at the end of the second paragraph (etymology=origin of words).
- (C) This is also mentioned in the passage.
- (D) This is the main function of a dictionary.

**The correct answer is E.**

### Passage 9 (Real NMAT Passage and Questions)

Topic—Tycho Brahe

Scope—Tycho Brahe's contribution to astronomy

#### Passage Map

P 1—To provide an introduction to Tycho Brahe.

P 2—To discuss Tycho's focus on accuracy.

P 3—To discuss some of Tycho's work and achievements.

P 4—To state how Tycho dispelled a popular belief held at that time.

P 5—To discuss the connection between Tycho's and Aristotelian Physics.

P 6—To highlight Tycho's contribution to modern astronomy.

1. What is the central idea of this passage?

- (A) The Tychonic system was a trailblazer that is in use even today.
- (B) Tycho's extensive use of Aristotelian physics endorsed his belief in Aristotle.
- (C) Tycho's discoveries paved the way for the development of modern astronomy.
- (D) Celestial spheres are still in existence today and dictate the course of astronomy.
- (E) Tycho's discoveries were instrumental in understanding how paths of planets and comets crossed.

The entire passage talks about how Tycho's work paved the way for modern astronomy. Option C states this best and is the correct answer.

The correct answer is C.

2. Which of the following, if true, would weaken the argument presented in the text?

- (A) Aristotelian physics played a part in Tycho's discoveries.
- (B) Astronomy was an active discipline in the sixteenth century.
- (C) Tycho was able to garner only limited fame discovering the star, Cassiopeia.
- (D) The Ptolemaic system was more accepted than the rejected Copernican model.
- (E) Tycho accidentally discovered that the spheres on which planets rested had gaps.

Nothing in the passage supports the fact that Ptolemaic system was more accepted while the Copernican model was rejected. In fact, the passage mentions that Tycho, to some measure, supported the theory proposed by Copernicus, and the Tychonic world system provided a middle ground between the Copernican models and Ptolemaic models. If at all the Ptolemaic system was more accepted while the Copernican model was rejected, it would indicate that Tycho's theories were based on a rejected theory, and hence could not become popular.

The 5<sup>th</sup> paragraph mentions that Tycho could not ignore Aristotelian Physics, and hence if option A was true, it would not weaken the argument. The existence of various theories related to astronomy in the sixteenth century supports option B. There is nothing in the passage that would weaken the argument if options C or E were true.

The correct answer is D.

3. The author mentions all of the following EXCEPT:

- (A) Kepler's discovery of elliptical planetary orbits.
- (B) Tycho's other assistants and their achievements.
- (C) Tycho modernised astronomical instrumentation.
- (D) Tycho's work endorsed the Aristotelian definition of comets.
- (E) Tycho's discovery of the shell of fixed stars was centred on the Earth.

While the passage mentions Kepler, who was Tycho's assistant, once at the end of the second paragraph, it never goes into the details (or even mentions the work) of his other assistants or their achievements. So, B is the correct answer.

The correct answer is B.

4. Based on the passage, what can be concluded about the author's tone when writing about Tycho Brahe?

- (A) It is cynical.
- (B) It is mocking.
- (C) It is supportive.
- (D) It is ambivalent.
- (E) It is pessimistic.

The author definitely views Tycho Brahe positively.

The correct answer is C.

## Passage 10

### Topic—Fingerprint records

**Scope**—The criminal and civil uses of fingerprint records and how fingerprint impressions can be taken

### Passage Map

**P 1**—To state the importance/uses of maintaining fingerprint records.

**P 2**—To describe the civil uses of fingerprint records which are often overlooked in favour of the criminal uses.

**P 3**—To describe the actual mechanics of how fingerprints are formed and how fingerprint impressions can be taken.

1. In the second paragraph, what is the function of the sentence *However, the Civil File of the Identification Division of the Federal Bureau of Investigation contains three times as many fingerprints as the Criminal File*?
  - (A) To explain how fingerprints can have humanitarian uses such as helping to identify victims of natural disasters.
  - (B) To illustrate the importance of fingerprints in different fields.
  - (C) To state that the Civil File of the FBI has more fingerprints than does the Criminal File.
  - (D) To point out that fingerprints have another more important use that is different from the one that is commonly perceived by the people.
  - (E) To conclude that fingerprints play an important secondary role in the civil society as well.

The question is asking you for the role of the sentence, that is, why did the author put this sentence in this paragraph? Since this is a function question, you need to answer for the 'why' and not the 'what'. Note that the sentence starts with the term 'however', which immediately implies that it is trying to show a contrast with the previous statement. The previous statement states that the lay mind associates fingerprints with being useful primarily in criminal investigation.

The second sentence then creates the contrast by stating that this is not the case and that, in fact, there are more fingerprints in the Civil File of the FBI than in the Criminal File; thereby implying that fingerprints probably have a more important or an equally important role outside of criminal investigation as well. Thus, the function of this sentence is to create this contrast between the two

roles of fingerprints. (D) brings this out best and is the correct answer.

- (A) This is the purpose of the entire paragraph and not just of this sentence.
- (B) Same as A.
- (C) This is the literal meaning of the sentence, but we need to answer why the author is stating this fact.
- (E) Same as A.

The correct answer is D.

**Note that in such questions the wrong answer choices will typically provide you the answer for the entire paragraph and not for the specific sentence or they will paraphrase the sentence in question, that is, answer 'what' rather than 'why'.**

2. From the information in the passage, which of the following can be most properly inferred?
  - (A) Fingerprint impressions obtained with the use of ink are better than those obtained using substances such as dirt or grease.
  - (B) Fingerprints have many more uses in criminal investigation than they do in civil cases.
  - (C) The matching of fingerprints is the most foolproof way of apprehending hardened criminals.
  - (D) The use of fingerprint records helps the justice system deliver more equitable sentences.
  - (E) The presence of saline substances on the ridges of fingertips makes it difficult to get a definite fingerprint impression.

The first paragraph clearly states that the use of fingerprint records results in the imposition of more equitable sentences by the judiciary. (D) states this almost verbatim and is the correct answer.

- (A) While common sense dictates that this may very well be the case, there is nothing in the passage to suggest this.
- (B) The second paragraph states that this is not the case and that, in fact, the opposite may be true.
- (C) Extreme option. We know that this is a very important way, but we do not know whether this is the most foolproof way. There could always be a better way.
- (E) According to the latter half of the third paragraph, the opposite may actually be true.

The correct answer is D.

3. What is the main purpose of the author in writing the passage?

- (A) To explain the need for collecting fingerprints.
- (B) To advocate the study of civil fingerprints to assist the judiciary.
- (C) To analyse the implications of maintaining a database of fingerprints.
- (D) To praise the advocates for bringing to justice the repeat offenders.
- (E) To discuss the history, usefulness and mode of collecting fingerprints.

The passage starts by discussing the importance of fingerprints in criminal investigation, and then goes on to explain their importance in civil cases as well. It finally concludes by discussing the various modes of fingerprint collection. (E) summarises all of this best and is the correct answer.

- (A) The author is explaining a process which is already in place; so, he is not explaining or justifying the 'need' as such.
- (B) The author never advocates anything in the passage.
- (C) This is too narrow in scope. (E) states the main purpose much better.
- (D) While the 'advocates' are mentioned in the passage, the main purpose of the passage is much more than to just state this fact.

The correct answer is E.

4. According to the information in the passage, the impressions of the fingerprints can be obtained from all of the following, EXCEPT:

- (A) Saline substances
- (B) Ink
- (C) Grease
- (D) Wax
- (E) Perspiration

Towards the end of the third paragraph, wax is mentioned as one of the probable mediums or backgrounds on which one can take fingerprints and not the substance that actually needs to be applied on the fingers. Hence, (D) is the correct answer.

- (A) Inferred from the third paragraph.
- (B) Inferred from the third paragraph.
- (C) Inferred from the third paragraph.
- (E) Inferred from the third paragraph by the use of 'saline substance emitted from the glands'.

The correct answer is D.



## Passage 11

**Topic**—Robotic vision

**Scope**—How self-guided robots perceive their surroundings and a possible innovation with regards to the same

### Passage Map

**P 1**—To introduce two methods by which a robot can understand its environment—Stereoscopic vision and SLAM—and state that SLAM is the preferred method these days.

**P 2 and P 3**—To discuss problems with using range finders and how range finders can be replaced by digital cameras.

**P 4**—To conclude that it will not be easy to replace range finders with video cameras, given the complex nature of computations that need to be done.

1. According to the passage, integration of images from two 'eyes' is termed as:

- (A) computer processing
- (B) SLAM
- (C) stereoscopic vision
- (D) sensors
- (E) autonomous angles

The first paragraph explains stereoscopic vision as integration of images from two 'eyes'.

**The correct answer is C.**

2. From the passage, each of these can be inferred, EXCEPT:

- (A) Digital cameras are cheaper than range finders.
- (B) Range finders allow robots to see with one eye.
- (C) The Cyclops is a mythical creature.
- (D) To work independently, a robot must be able to understand its surroundings.
- (E) Range finders have the ability to create 3D maps.

The second paragraph states that, for digital cameras to replace range finders, it is imperative that digital cameras be able to make 3D maps. But this does not necessarily imply that range finders were also making 3D maps; it is possible that range finders were making use of something entirely different. Hence, (E) should be the answer.

- (A) This is stated in the first line of the second paragraph.
- (B) The opening lines of the passage talk about Dr. Davison, who thinks that one eye is enough for a robot. These robots have so far been using

range finders to see with one eye, and now Dr. Davison wants to replace these rangefinders with digital cameras. So, rangefinders do allow robots to see with one eye.

- (C) This can be implied from the first line of the passage.
- (D) This can be inferred from these lines in the first paragraph: *For a robot to work autonomously, it has to understand its environment.*

**The correct answer is E.**

3. According to the passage, why is a digital camera preferred over range finders?

- (A) Development of images is better.
- (B) It is small and economical and well-understood.
- (C) It is more fiddly.
- (D) It can continuously update images.
- (E) It can upload 3D maps.

The second paragraph mentions that range finders are expensive and fiddly as opposed to digital cameras which are small and cheap, because of which Dr. Davison prefers the latter.

**The correct answer is B.**

4. What is the main purpose of the author in writing the passage?

- (A) To explain why SLAM is better than stereoscopic vision.
- (B) To advocate the use of digital cameras in place of range finders.
- (C) To analyse emerging techniques in computers.
- (D) To praise a scientist for his groundbreaking work.
- (E) To discuss techniques for use in self-guided robots.

The whole passage talks of computer programmes that will help in the development of self-guided robots. Option (E) provides an apt summary that lucidly indicates the essence of the passage.

- (A) This is just a part of the passage, but the passage is doing much more than just this.
- (B) It is Dr. Davison who is advocating this fact; the author of the passage is neutral in his tone.
- (C) The passage is only about robots and not computers in general.
- (D) The author does not praise anyone in the passage.

**The correct answer is E.**

## Passage 12 (Real NMAT Passage and Questions)

Topic—Social networking

Scope—Privacy concerns with regards to social networking.

### Passage Map

P 1—To provide an introduction to social networking.

P 2—To discuss the importance of privacy in the realm of social networking.

P 3—To provide some statistics to support the points made in Para 2.

P 4—To provide examples of types of content posted by users on social networking sites.

P 5—To provide a quote that shows the widespread nature of the problem.

P 6—To discuss the problem of identity theft.

P 7—To provide a conclusion to the passage.

1. What is the central idea of the passage?

- (A) Posting private details on social networks has the most serious negative implications for identity theft.
- (B) Online social networking has become the lifeline of modern times.
- (C) Personal information should not be posted on social networks.
- (D) Users of social networks are prone to serious privacy attacks.
- (E) Facebook is the first choice of the users of social networks.

Option D is the key message of the paragraph which discussed the issues surrounding the use of the internet and personal information that is accessible.

The correct answer is D.

2. The author most likely agrees with all of the following statements EXCEPT:

- (A) cyberspace is becoming a primary source of information for employers looking for prospective candidates.
- (B) most users in cyberspace are yet to cultivate some trust on online shopping.
- (C) in a single year, around 210 crore new subscribers joined Facebook.

(D) profit is the main motive of most social networking operators.

(E) crores of tweets are sent in the cyberspace in a single day.

Option B is correct. Paragraph three indicates that a great deal of money is spent each day on online shopping which indicates users' trust in online shopping.

The correct answer is B.

3. According to the author, which of the following is true in the context of the impacts of social networks?

- (A) Governments in developed countries are considering comprehensive cyber laws to protect users' privacy.
- (B) Barring a few reputed social networks, most others collect user-data to personalise their services.
- (C) Professional users of social networks learn to keep their online postings away from public view.
- (D) Sharing personal photographs online does not pose any serious privacy threat to the users.
- (E) One-fourth of Internet surfers still keep away from using social networks.

Option E is implied in the third paragraph where it states that 75% of Internet users use social media.

The correct answer is E.

4. Which of the following is not implied in the passage?

- (A) If you are in cyberspace, your privacy concerns are genuine.
- (B) It is not possible yet to retract the data once uploaded to cyberspace.
- (C) Social network operators sell users' private information to companies on profit.
- (D) Cyber laws are not stringent enough to provide protection against users' identity theft.
- (E) Increasing sophistication of technology has played a role in imposing some control on threats to privacy.

Option (E) is correct as the final paragraph indicates that there are no rules or regulations to protect individuals.

The correct answer is E.

## Passage 13

Topic—Cyberspace

Scope—What is cyberspace and how it has changed in recent times

### Passage Map

P 1—To describe what is cyberspace.

P 2—To describe how different people have used cyberspace for different ends.

P 3—To describe the revolution that has taken place in cyberspace in recent times.

1. Which of the following cannot be inferred from the information in the passage?
  - (A) The term 'cyberspace' has been in use for over a century.
  - (B) People have used cyberspace to make profits.
  - (C) Cyberspace is not really a physical place.
  - (D) Regulations have been made governing cyberspace.
  - (E) Some people have used cyberspace to commit crimes.

The opening lines of the passage clearly state that the term 'cyberspace' was coined in 1982; so, it cannot possibly have been in use for over a century.

- (B) Clearly stated in the second paragraph.
- (C) The third paragraph states that *though there is still no substance to cyberspace*. So, even though the author believes that the cyberspace is a separate place, it still does not have a physical form or location.
- (D) The second paragraph states that people have regulated cyberspace.
- (E) Stated in the last sentence of the second paragraph.

The correct answer is A.

2. What is the main purpose of the third paragraph in the passage?
  - (A) To underline the importance of cyberspace.
  - (B) To delineate the underlying threat of cyberspace to normal man.
  - (C) To explain how cyberspace means different things to different people.
  - (D) To discuss the changes that have taken place in cyberspace in the last two decades.

- (E) To discuss the political and social impact of cyberspace.

The opening sentence of the third paragraph states that cyberspace has changed rapidly in the past 20 years and the rest of the paragraph goes on to describe these changes.

- (A) The author has discussed cyberspace with reference to its impact and growth; its importance with reference to anything else is not mentioned in this paragraph, making this option out of scope.
- (B) No such threat is mentioned anywhere in the paragraph.
- (C) This is actually mentioned in the second paragraph and not in the third.
- (E) While this is mentioned in the last sentence of the paragraph, the main purpose of the paragraph is more than just to state this.

The correct answer is D.

3. Which of the following would the author of the passage not agree with?

- (A) Cyberspace includes email, social media websites, e-commerce and so on.
- (B) It would be incorrect to consider cyberspace an individual entity.
- (C) Books have been written about cyberspace.
- (D) Modern cyberspace is an amalgam of telephones and computers.
- (E) Thousands of people are involved with cyberspace in some way or the other.

Note the wording of this question—which of the following is not true—which is different from an except question. (In case you have forgotten this difference, go through except questions once again on page 285 of this book). So, you basically need to identify an option that states the opposite of what the author has stated in the passage. (B) does this best and is the correct answer, because the author clearly states in the third paragraph that the cyberspace is its own separate place.

- (A) Since this is not mentioned in the passage, we have no way of figuring out whether the author believes this is true or not.
- (C) Can be inferred from the second paragraph.
- (D) Can be inferred from the third paragraph.
- (E) Can be inferred from the last sentence of the first paragraph, and also from the end of the third paragraph.

The correct answer is B.

## Passage 14

**Topic**—The Indian culture and its connection with philosophy/spirituality

**Scope**—Philosophy/spirituality, and not invasions and foreign rules, best describe Indian culture

### Passage Map

P 1—To state that philosophy was the biggest achievement and also contribution, of the Indian civilisation.

P 2—To state that the history of India can be understood best in the spiritual context.

P 3—To further build on P2 by stating that, as it has done in the past, spirituality will define Indian culture and lead to its growth in the future as well.

- Each of the following can be inferred from the information in the passage EXCEPT:
  - India has faced various foreign invasions in the past.
  - Philosophy was held in high regard in older civilisations.
  - There has been complacency in Indian philosophical thought.
  - Unity of India was affected due to its vast geographical area.
  - Political invasion has not had any impact on India's spiritual integrity.

The author has reiterated the underlying unity of Indian spirit through the ages in the passage. He has cited political examples which could have broken the spirit of India, but failed. The author also mentions in the first paragraph: 'it indicated the ... peoples produced'. Hence, (D) is the correct answer.

- The author has mentioned various invaders like the Huns, Scythians and so on.
- The first paragraph talks of philosophy being regarded as the 'goal of all the highest ... activities'.
- In the last paragraph, the author describes political events as 'hurricanes' and goes on to mention that the 'passivity of some centuries' is temporary and did not have any impact on the underlying spirituality of the country.
- Can be inferred from the last paragraph of the passage.

The correct answer is D.

- The author predicts that India:
  - will rule the world sometime in the future.
  - will resurface as a philosophical power.
  - will actively contribute to the progress of mankind.
  - will contribute again to spirituality.
  - will progress due to its political machinery.

In the last paragraph, the author reiterates the fundamental unity of the country. It is also inferred by his use of the term 'after a passivity of some centuries'—he concedes that spiritual India encountered a setback due to distractions of war—however, the underlying unity will resurface. Hence, (D) is the best option.

- Not mentioned.
- Author has not mentioned Indian philosophy as a power—retained or lost.
- Out of scope—author is discussing India's contribution to philosophy and not to the progress of mankind.
- Not mentioned—political triumph has only been mentioned to illustrate political instability.

The correct answer is D.

- What is the primary purpose of the author in writing the passage?
  - To compare Indian philosophy with that of other civilisations.
  - To analyse the connection between Indian civilisation and philosophy.
  - To trace the impact of political invasions on Indian philosophy.
  - To discuss the points of unity in India.
  - To discuss the rise of spiritual aspirations in India.

The author has, in the passage, discussed the philosophy of India. He has analysed the underlying factors responsible for its incredible sustainability through the ages, across political upheaval and geographical boundaries. Hence, (B) is the best answer.

- The author never compares Indian philosophy with anything.
- The political invasions are mentioned by the author to reiterate the sustainability factor of philosophy.

- (D) The unity of India is not under discussion—as per the first paragraph, the author has put philosophy over and above everything else.
- (E) The 'rise' is misleading—the spirituality is assumed in the passage.

The correct answer is B.

4. From the passage, which of the following cannot be concluded about Indian philosophy?

- (A) It has a goal of bringing together different people.
- (B) It brought together practical and theoretical activities.
- (C) It was immune to political upheavals.
- (D) Spirituality is an important part of it.
- (E) It is not subjugated by time.

The author never mentions that the goal of philosophy is to bring together different people. Hence,

- (A) Is the best answer.
- (B) Inferred from the first paragraph.
- (C) The second paragraph has mentioned categorically that it has 'outlived' all political changes.
- (D) The first paragraph talks of spirituality being an integral part of philosophy.
- (E) The third paragraph mentions the passivity of the philosophy, and also predicts its rise after a 'few centuries'.

The correct answer is A.

**Passage 15 (Real NMAT Passage and Questions)****Topic**—Turtle walk**Scope**—To describe the turtle walk and highlight its importance.**Passage Map****P 1**—To provide an introduction to turtle walk.**P 2**—To provide some details about Olive Ridley turtles.**P 3**—To describe the actual turtle walk process.**P 4**—To provide views of volunteers to the event.**P 5**—To conclude that despite minor hiccups, the turtles are thriving in this region.

1. How would you describe the tone of the passage?

- (A) Sad
- (B) Cheerful
- (C) Informal
- (D) Descriptive
- (E) Non-committal

The tone of the passage is descriptive as things like the turtles nests, what the baby turtles look like when they are first born, the activities of the volunteers are all described in detail throughout the passage.

**The correct answer is D.**

2. The passage does not mention that the Olive turtles:

- (A) are protected under the Wildlife Act.
- (B) are being threatened by coastal urbanisation.
- (C) do not bother about their babies after they lay eggs.
- (D) hatch baby turtles that are black when newly born and wet.
- (E) on the Chennai beaches have been consistently increasing.

Option A is mentioned in paragraph one.

Option B is mentioned in the final paragraph.

Option C is mentioned in the third paragraph.

Option D is mentioned in the fourth paragraph.

Option E is not mentioned in the text.

**The correct answer is E.**

3. The passage:

- (A) describes arribadas as mass-synchronised nesting.
- (B) does not mention the gestation period of the Olive turtles.
- (C) mentions Olive turtles to be the only species known for arribadas.
- (D) does not mention anything about volunteers witnessing the actual hatching process.
- (E) mentions that the highest number of turtle nests were found during the walks of Year 1991.

Option B is mentioned in paragraph three.

Option C is discussed in paragraph two which states there are two species.

Option D is described in paragraph three.

Option E is discussed in the final paragraph.

**The correct answer is A.**

4. Which of the following is not mentioned in the passage?

- (A) The walkers dig out buried turtle eggs from the sand and relocate them to safer places at night.
- (B) The Olive Ridley Turtles' nests are pot-shaped having a narrow neck above a broader chamber base.
- (C) There is reason to believe that the Olive Ridley Turtles are surviving despite the threats to them from rapid urbanisation.
- (D) The about two and a half feet long Olive Ridley Turtles nest in the beaches of Chennai between the months of December and April.
- (E) Environmental enthusiasts look forward to the bi-annual Chennai turtle-walk so as to be able to discuss ways of protecting the endangered species.

Option A is mentioned in the third paragraph.

Option B is mentioned in the penultimate paragraph.

Option C is described in the final paragraph.

Option D is mentioned in paragraph two.

Option E is not mentioned in the passage.

**The correct answer is E.**

## 9 Parajumbles

1. (a) Atal Bihari Vajpayee too was a fan of mangoes and his childhood friend Anna Kiwalkar would send him two crates every week during the season.
  - (b) The exchange is termed as 'mango diplomacy' and is seen as winning over foes.
  - (c) Former PM Indira Gandhi's love for mangoes was well known within her circle and close friends visiting her would always get mangoes for her.
  - (d) This exchange is based on the intense national pride across South Asia about whose mangoes are the most delicious.
  - (e) Prime Ministers of India and Pakistan frequently send the best varieties of mangoes from their respective countries to each other.
- (A) caedb  
(B) bdeac  
(C) deacb  
(D) baedc  
(E) cdeab

*this exchange* and *the exchange* are the clues to the right sequence—edb. Also sentence (a) has to come immediately after sentence (c) because of the use of *too* in sentence (a).

**The correct answer is A.**

### 2. (Real NMAT Question)

- (a) According to this method, an injection of cyanide would keep the horns safe, but would be fatal to anyone who consumes a part of the horn.
  - (b) Although it is illegal to procure these items, the poaching of these exquisite animals continues to this day, with the number of rhino deaths hitting a shameful peak in 2010.
  - (c) It is hoped that this would effectively render the black market for rhino parts redundant.
  - (d) A South African rhino reserve owner has come up with an ingenious suggestion; poison the horn.
  - (e) The Asian market for alternative medicine is infamous for its use of animal parts, notable among them being the fin of a shark and the horn of a rhino.
- (A) dbace  
(B) dcabe  
(C) edacb  
(D) ebdac  
(E) ebdca

The paragraph cannot start with sentences (a), (b) and (c) because they contain the pronouns *this*, *these* and *this*, respectively. Sentence (b) talks about these exquisite animals, which can only refer to shark and rhino in sentence (e). Thus, eb is a logical pair. And *this method* in sentence (a) refers to the ingenious suggestion in sentence (d). Thus, da is also a logical pair, making option (D) the correct answer.

**The correct answer is D.**

3. (a) The app was initially designed for transferring money over the mobile since carrying cash was risky.
  - (b) Vodafone brought m-pesa to India and launched it as a pilot in Rajasthan, rolling it out fully in 2013.
  - (c) But it soon changed into a financial service and became a big hit.
  - (d) M-pesa, a mobile based application, started in Kenya in 2007 as a CSR pilot project by Safaricom, a Vodafone subsidiary.
- (A) bcad  
(B) dacb  
(C) dcab  
(D) bcda  
(E) dbca

Sentences da form a logical pair since the 'the app' in sentence (a) refers to 'application' in sentence (d). Also the entire paragraph is about M-pesa, so it should start with sentence (d). Thus, option (B) is the correct answer.

**The correct answer is B.**

4. (a) Only then can any virus make use of its single talent, which is to take control of a host's cellular machinery and use it to churn out thousands of copies of itself
  - (b) In this way, one infected cell soon becomes billions.
  - (c) These viruses then move from one cell to the next, transforming each new host into a factory that makes even more virus.
  - (d) A virus is nothing more than a few strands of genetic material wrapped in a package of protein—a parasite, unable to function on its own.
  - (e) In order to survive, it must find a cell to infect.
- (A) dceab  
(B) bcead

- (C) deacb
- (D) decab
- (E) bdcea

The entire paragraph is talking about the virus, so (d) should be a good starting sentence. (e) makes a logical sentence after (d). Option (c) should come after option (a), since it is a logical progression of the thought mentioned in (a). Option (b) should be the last sentence of the paragraph.

**The correct answer is C.**

5. (a) If this is so, then public spaces function like a stage in the same way that our own homes and living rooms do.
- (b) Several scholars over the years have drawn analogies between life and theatre.
- (c) For instance, the eminent sociologist Erving Goffman suggested that life is a series of performances, in which we are all continually managing the impression we give other people.
- (d) Architecture, landscaping, the dimensions of the stage, and the other actors around us all offer cues about how we should perform and how we should treat one another.
- (A) acdb
  - (B) badc
  - (C) cdeb
  - (D) edcb
  - (E) bcad

The entire paragraph is concerned with comparing life with a theatre performance. Thus, (b) should be a good starting sentence. (c) should come next because it provides an example of the scholars mentioned in (b). (a) makes sense after option (c) and option (d) should then come at the end.

**The correct answer is E.**

6. (a) The reality is that studies do not confirm such phases.
- (b) There is an almost universally accepted perception that we must pass through certain phases in our processing of grief.
- (c) Grief reactions never follow the simple stages often described in textbooks and other media in the public domain.
- (d) This idea is based on the fact that well-known theorists many decades back wrote about these phases.

- (e) Since then, this has been repeated so many times and in so many contexts and in so many media outlets that it has been taken as a fact.

- (A) cbade
- (B) bdeac
- (C) cdbae
- (D) bedac
- (E) bdeca

The phrase *this idea* in sentence (d) refers to the universally accepted perception in sentence (b). Thus, bd is a link, and de is also a link. Putting sentence (a) after sentence (c) makes no sense. So, ac has to be the correct order.

**The correct answer is B.**

7. (a) The world's chief interest is, and has always been, in successful men such as him.
- (b) The popular interest in Henry Ford is not difficult to explain.
- (c) It does not matter whether their success has come in the right way or the wrong way.
- (d) It does not matter much in what field their achievement lies, so long as they have achieved.
- (e) Pirates, outlaws, prize fighters, soldiers, statesmen, writers, painters, movie stars—we are interested in all of them as long as they have been successful.
- (A) abcd
  - (B) abecd
  - (C) badec
  - (D) bdace
  - (E) bacde

Sentences (b) and (a) are a pair because the *him* in sentence (a) refers to *Henry Ford* in sentence (b). Putting sentence (c) after sentence (a) does not make sense because there is no antecedent for *their* in sentence (c). Thus (E) gets eliminated and (C) is the answer.

**The correct answer is C.**

8. (a) Self-driving cars promise to create a new kind of leisure, offering passengers additional time for reading books, writing emails, knitting, taking a catnap, and any number of other diversions.
- (b) People who are unable to drive themselves could experience a new kind of independence.



- (c) Moreover, self-driving cars could re-contextualise land use on a massive scale.
- (d) In this imagined mobility utopia, drone trucks would haul packages across the country and no human would have to circle a city block in search of a parking spot.
- (A) adbc  
(B) acbd  
(C) cbad  
(D) abcd  
(E) bacd

The entire paragraph is talking about self-driving cars, so (a) should be a good starting sentence. Then things get a little tricky because (b) and (c) both look good as the second sentence. However, if you read these two sentences in the order (cb), you will realise that it does not make any sense because the two sentences are talking about different things. Reading these two sentences as (bc), however, works because of the transition word 'moreover' that connects these two sentences. So, (bc) it should be, with (d) coming at the end.

**The correct answer is D.**

9. (a) The reward system was about pleasure and somehow learning what yields it, and little more.
- (b) If you had opened a textbook on brain rewards in the late 1980s, it would have told you that the dopamine and opioids that swished and flickered around the reward pathway were the blissful brain chemicals responsible for pleasure.
- (c) It wasn't until the early 1990s, after rigorous research, that he felt bold enough to go public with his new thesis.
- (d) So when Berridge, a dedicated young scientist who was more David than Goliath, stumbled upon evidence in 1986 that dopamine did not produce pleasure, but in fact desire, he kept quiet.
- (A) acbd  
(B) badc  
(C) bdac  
(D) cbad  
(E) cdba

The whole paragraph is concerned with dopamine and rewards, making (b) a good starting sentence. (a) needs to come next since it is also talking about

the reward system. dc then make a logical pair, because the 'he' in (c) refers to the 'Berridge' in (d).  
**The correct answer is B.**

#### 10. (Real NMAT Question)

- (a) However, at least for now, it seems that the nations whose people eat shark fins have the upper hand.
- (b) In fact, in China, due to it being so expensive serving the shark-fin soup is seen as a mark of respect.
- (c) By some estimates, some 73 million sharks killed each year by finning fishermen leading to widespread demand from wildlife experts to protect sharks.
- (d) No wonder then, that despite shark meat it not being so popular, sharks are hunted for their fins, leading to the infamous 'shark-fin soup', where sharks are de-finned and thrown back into the sea.
- (e) Shark fins, reportedly fetching up to \$10,000 a fin, are used to create the delectable shark soup in countries such as Hong Kong, China, Japan, Taiwan and Singapore.
- (A) abedc  
(B) bcda  
(C) dceab  
(D) ecbad  
(E) ebdca

All the sentences talk about shark fin. Since sentence (e) introduces this topic, the correct sentence has to start with sentence (e). The use of *however* in sentence (a) implies a contrast and this contrast only comes about if it is placed after sentence (e).

**The correct answer is E.**

11. (a) Soon afterwards, Lata falls in love with a young student at her university, whose name is Kabir.
- (b) Lata is Hindu, and Kabir is a name used by both Hindus and Muslims.
- (c) *A Suitable Boy* is the story of Lata Mehra and her search for a husband.
- (d) However, it turns out that Kabir is Muslim.
- (e) The novel opens with the wedding of Lata's elder sister Savita to Pran Kapoor and Mrs. Rupa Mehra's edict to Lata, 'You, too, marry a boy I choose'.

- (A) cdeab
- (B) eabcb
- (C) ceabd
- (D) ebcda
- (E) cebad

Sentence (c) has to be the opening sentence, since the entire paragraph is about the novel mentioned in sentence (c). Sentence (e) should come immediately after sentence (c). bd is also a logical pair.

The correct answer is C.

12. (a) Those who do remember him tend to use him as a cautionary tale.
- (b) His charismatic personality, combined with his controversial scientific accomplishments, landed him on TV more than once, notably on The Steve Allen Show
- (c) Instead of dazzling audiences with complicated science, McConnell captivated them with awe-inspiring concepts
- (d) McConnell's experiments have largely faded from scientific memory
- (e) But at the end of the '50s, McConnell was a big deal
- (A) cdbae
  - (B) bcdae
  - (C) daebc
  - (D) edcba
  - (E) aedbc

The whole paragraph is concerned with McConnell, so (d) should be a good starting sentence. (a) should come next followed by (e). bc then form a logical pair, since (c) further builds on the personality of McConnell described in (b).

The correct answer is C.

13. (a) The band stretches from the Tropic of Cancer to the Tropic of Capricorn, though there are occasional reefs at higher latitudes—near Bermuda, for instance.
- (b) Reefs can be hundreds of feet tall and thousands of acres in area.
- (c) The world's largest reef, or really reef system, is the Great Barrier Reef, along the east coast of Australia.

- (d) Coral reefs are found in a band that circles the globe like a cummerbund.
- (e) Unlike the Great Wall of China, the Great Barrier Reef, which extends more than fourteen hundred miles, is actually visible from the space.

- (A) acdeb
- (B) dacbe
- (C) aedbc
- (D) dbcea
- (E) cdaeb

(d) and (a) form a logical pair since the band in (a) is introduced in (d). (e) needs to come after (c), since (c) introduces the Great Barrier Reef. The only question then is where should (b) come—after (c) or after (a). Note that there is no option that puts (b) immediately after (a). Then you go with cbe as the correct order.

The correct answer is B.

#### 14. (Real NMAT Question)

- (a) In their first study, university students were asked to describe a difficult and an easy project that they intended to complete during the winter break.
- (b) For difficult projects, implementation intentions were clearly related to successful completion.
- (c) Projects included such things as writing a class paper, working on resolving family conflicts and participating in athletic activities.
- (d) Students were also asked if they had specific plans about when, where and how to get started on each project.
- (e) Project completion was checked after students returned to school.
- (A) abcde
  - (B) bcdea
  - (C) cdeab
  - (D) acbde
  - (E) dabce

Taking a quick look at the sentences, we realise that the paragraph has to start with sentence (a) and end with sentence (e). This brings us down to options (A) and (D). The placement of sentence (c) looks good after sentence (a) but doesn't make sense after sentence (b). Thus, option (D) is the correct answer.

The correct answer is D.

15. (a) Science, to the ordinary reader of newspapers, is represented by a varying selection of sensational triumphs, such as wireless telegraphy and aeroplanes, radio-activity and the marvels of modern alchemy.
- (b) The increased command over the forces of nature which is derived from science is undoubtedly an amply sufficient reason for encouraging scientific research, but this reason has been so often urged and is so easily appreciated that other reasons, to my mind quite as important, are apt to be overlooked.
- (c) Science, in this aspect, consists of detached up-to-date fragments, interesting only until they are replaced by something newer and more up-to-date, displaying nothing of the systems of patiently constructed knowledge out of which, almost as a casual incident, have come the practically useful results which interest the man in the street.
- (d) It is with these other reasons, especially with the intrinsic value of a scientific habit of mind in forming our outlook on the world that I shall be concerned with.
- (e) However, it is not this aspect of science that I wish to speak of.
- (A) acbed  
(B) cebda  
(C) aebcd  
(D) bedac  
(E) aecbd

On reading through all the options, you may notice that (d) contains the phrase *these reasons*. What are these reasons? It must be what is mentioned at the end of (b). Thus (d) has to necessarily come right after (b). This eliminates (A), (C) and (D).

The placement of (a) at the end in (B) doesn't make sense. It's much better to start with (a). Thus (E) is the best answer.

The correct answer is E.

#### 16. (Real NMAT Question)

- (a) As I got off at Terminal B, I couldn't help marvelling at the vastness of the O'Hare Airport.
- (b) My husband, who was very concerned that I was travelling alone, printed out a map of the airport before I left.
- (c) Since I did not have any pressing demands on my time, I decided to make the trip.
- (d) My sister, who lived in Seattle, wanted us to be present at her house-warming ceremony.

- (e) Although we tried very hard, we were able to obtain only one ticket for that date.
- (A) abdec  
(B) badec  
(C) cdeba  
(D) dceba  
(E) decba

The entire paragraph has to start from the invite from the sister. Thus, sentence (d) should be the first sentence. Sentence (e) gives the reason for sentence (c)—why the lady is making the trip alone.

The correct answer is E.

17. (a) Every cook knows that dry or ripe peas, and other farinaceous seeds, cannot easily be boiled in hard water because the farina of the seed is not perfectly soluble in water loaded with earthy salts.
- (b) In the culinary art, the effects of impure water are likewise obvious.
- (c) It cannot be denied that water that is hard, or loaded with earthy matter, has a decided effect upon some important functions of the human body.
- (d) However, the purity of the waters employed in some of the arts and manufactures, is an object of no less importance.
- (e) For example, in the art of the dyer, hard water not only opposes the solution of several dye stuffs, but it also alters the natural tints of some delicate colours.
- (A) cebad  
(B) cdeab  
(C) badec  
(D) beadc  
(E) cdeba

This question is an interesting example of how to use transition words to order the sentences. The use of *however* in (d) tells you that it needs to set up a contrast with the previous sentence. *For example* in (e) tells you to put something that (e) is an example of, before (e). Likewise in (b), tells you to put something similar before it. Also, if you know the meaning of *culinary* (pertaining to cooking), you immediately know that (a) needs to come immediately after (b). This brings you down to (A), (C) and (E). It makes no sense to put (d) after (a) since there is no contrast between the two sentences. Therefore (E) is the correct answer.

The correct answer is E.

18. (a) In a treatise of about that time entitled 'Pneumatica', Hero, of Alexandria, described not only existing devices of his predecessors and contemporaries but also an invention of his own which utilised the expansive force of steam for raising water above its natural level.
- (b) While the time of man's first knowledge and use of the expansive force of the vapour of water is unknown, records show that such knowledge existed earlier than 150 B.C.
- (c) The third method, which is known as 'Hero's engine', made use of a hollow sphere that was rotated by steam.
- (d) However, Hero makes no suggestions as to application of this or any of the other devices he mentioned in his writings.
- (e) He clearly describes three methods in which steam might be used directly as a motive of power; raising water by its elasticity, elevating a weight by its expansive power and producing a rotary motion by its reaction on the atmosphere.
- (A) baecd  
(B) ecdab  
(C) aecdb  
(D) bacde  
(E) ecdba

On reading through all the sentences, you may notice that (c) needs to come immediately after (e). Also notice the use of the phrase 'that time' in (a) which suggests that the sentence before this should talk about some time period. (b) is the only sentence that does that. Thus (a) needs to come immediately after (b). Option (A) is the only one that satisfies both these requirements and so is the correct answer.

The correct answer is A.

19. (a) Thus, it seems safe to conclude that pregnant women should absolutely avoid alcohol.
- (b) These babies generally exhibit facial distortion, inability to concentrate and difficulty in remembering.
- (c) In fact, the negative effects of alcohol on a fetus are so pronounced that babies born after exposure to alcohol are said to be suffering from fetal alcohol syndrome.
- (d) Because alcohol is delivered quickly into the blood and passes quickly into the tissues and membranes, the human fetus is particularly vulnerable to its effects.
- (e) One of the most dangerous drugs for pregnant women to consume is alcohol.

- (A) decba  
(B) ecdba  
(C) dcbae  
(D) edcba  
(E) eadbc

On reading through the options, you may notice that (d) and (c) will come together since they both mention the human fetus. The use of 'in fact' in (c) suggests that (c) needs to come right after (d) to emphasise the point being made in (d). This brings us to options (C) and (D). In option (C) the placement of (e) after (a) doesn't make any sense. Thus option (D) is the only option that contains a logical order of the statements and is the correct answer.

The correct answer is D.

20. (a) The organisations have their reasons for such differential pricing such as expanding internet access in price sensitive markets such as India.
- (b) Airtel was recently under customer fire for pricing differentially calls made over the internet.
- (c) However, all these actions amount to violating net-neutrality and may result in discriminatory internet access to unsuspecting customers.
- (d) Reliance Communications too was under fire for offering Facebook access at a lower internet cost.
- (A) bcad  
(B) bdac  
(C) adcb  
(D) abdc  
(E) dcba

Sentences (b) and (d) form a logical pair—the keyword is 'too' in sentence (d). This brings us down to options (B) and (D). 'Actions' in sentence (c) refer to the 'reasons' in sentence (a). Thus, ac also becomes a logical pair, making option (B) the correct answer.

The correct answer is B.

## 21. (Real NMAT Question)

- (a) No wonder companies everywhere have a stake in the health and fitness of their employees and are willing to spend considerable amounts for this purpose.
- (b) Our health is important to us, to our families and to our employers.
- (c) This is considered an important factor contributing to high productivity and quality work.

- (d) Japanese companies particularly excel in this and the more successful among them start off the day with a body bending and stretching session.
- (A) dbac  
(B) abdc  
(C) cabd  
(D) badc  
(E) bcda

Sentences (a) and (c) both contain *this* that refers to companies having a stake in the health and fitness of their employees in sentence (a). Thus, sentences (c) and (d) both have to come after sentence (a), which brings us down to options (B) and (D). Between sentences (b) and (a), the logical order is ba since only then will the 'no wonder' in sentence (a) make sense. Thus, option (D) is the correct answer.

**The correct answer is D.**

22. (a) We, who live in India, may not have noticed this quirky behaviour because cricket is so intrinsic to our lives.
- (b) She saw some others wielding imaginary bats, hitting imaginary sixes and making 'tok' sounds with their tongues.
- (c) An NRI visiting Delhi said she noticed many boys and men volleying imaginary balls at an imaginary player while walking down a corridor or a footpath.
- (d) They did all this imaginary play, even when their thoughts were occupied somewhere else.
- (A) bcda  
(B) cbda  
(C) cadb  
(D) badc  
(E) abcd

'all this' in sentence (d) refers to actions described in sentences (c) and (b). Thus, sentence (d) needs to come after sentences (b) and (c). Also 'she' in sentence (b) refers to the NRI in sentence (c). Thus, cbd becomes a fixed order. The only option that contains this order is (B), which should be the correct answer.

**The correct answer is B.**

**23. (Real NMAT Question)**

- (a) The flash floods in Uttarkashi caused unimaginable loss to life and property and was attributed to the mindless development of dams and felling of trees.

- (b) Due to the increasing incidents of such floods in India, a lot of questions are being raised on whether these flash floods are man-made disasters.
- (c) Flash floods are sudden swelling of water bodies that usually overflow and flood adjoining low-lying areas.
- (d) In fact, people posing these questions point to the flash floods in Uttarkashi in 2013.
- (A) adbc  
(B) bcad  
(C) cabd  
(D) cbda  
(E) dcab

da is a logical pair because sentence (d) introduces the flash floods in Uttarkashi, sentence (a) then elaborates upon. Since option (D) is the only option with this combination, it has to be the correct answer.

**The correct answer is D.**

**24. (Real NMAT Question)**

- (a) That translates to 20 products per minute!
- (b) Much more than that, it was about redefining customer experience and breaking online shopping inertia.
- (c) Started by two brothers, who not only saw their seed idea grow into a 4,500-member company, but also charted a stupendous success story with mind-numbing numbers, the online store had captured the shopping imagination of many.
- (d) The Bangalore-based firm ships more than 30,000 items per day.
- (A) cbad  
(B) cbda  
(C) cdab  
(D) acdb  
(E) adbc

da is a logical pair because the statistic mentioned in sentence (a) comes from the fact mentioned in sentence (d). This brings us down to options B and C. The placement of sentence (b) after sentence (a) does not make sense because there is no reference in sentence (a) for the phrase 'much more than that' in sentence (b). Thus, option (B) is the correct answer.

**The correct answer is B.**

## 25. (Real NMAT Question)

- (a) The final component of intimate relationships is usually commitment.
  - (b) In short, commitment means persevering 'through thick and thin'.
  - (c) Commitment shows a desire or keenness to continue a relationship into the future.
  - (d) Research suggests that people associate commitment with a sense of loyalty and faithfulness.
- (A) acdb  
(B) abcd  
(C) bcda  
(D) cdab  
(E) dabc

Sentence (a) provides an introduction to commitment that the other sentences then elaborate upon. Thus, the correct answer should start with sentence (a). This brings us down to options (A) and (B). Putting sentence (b) after sentence (a) does not make sense because sentence (b) is more of a summary sentence, so it should come later in the paragraph. Thus, option (A) is the correct answer.

The correct answer is A.

26. (a) Group decision-making is inherently a convergent process.
- (b) The primary goal is for members to agree on one of several decision options.
- (c) Examples of such decision-making include a jury deciding a criminal's fate or a family choosing a vacation spot.
- (d) In each of these cases, the task is to narrow the options down to one that is collectively endorsed by the group.
- (e) In this sense, group decision-making seems to be the antithesis of group creativity.
- (A) abcde  
(B) adcbe  
(C) bcda  
(D) bcdea  
(E) abced

Sentence (b) talks about 'decision options'. Sentence (c) talks about examples of 'such decision-making'. Sentence (d) then mentions 'In each of these cases'. Hence bcd is a logical sequence. Also, de forms a logical pair.

The correct answer is A.

Logical

## 6.0 Logical Reasoning Review

## 6.0 Logical Reasoning Review

The word 'logic' is derived from the Greek word 'logos', which means a word that expresses a thought or some information. This section, accordingly, measures your ability to comprehend and synthesise the information given in the question, without bothering with the truth or accuracy of that information. You will be asked to draw inferences from statements, choose between strong and weak arguments, identify assumptions implicit within innocuous-looking statements and even arrive at decisions in light of the given information.

You will also be required to use your lateral thinking skills on questions that require you to decode patterns—both numerical and visual—and series, make sense of relationships and understand directions. The key, while attempting Logical Reasoning questions, is to focus only on the information given to you and not allow any of your own knowledge, experiences or presumptions to cloud your judgment.

The Logical Reasoning section on the NMAT by GMAC™ will test you on the following two broad areas of reasoning:

1. Verbal Reasoning
2. Analytical Reasoning

Verbal Reasoning includes the following topics:

- Argument Questions
- Assumption Questions
- Inference Questions
- Critical Reasoning
- Decision Making
- Courses of Action

Analytical Reasoning includes the following topics:

- Linear and Circular Arrangements
- Classification
- Syllogisms
- Family Tree or Blood Relation Questions
- Coding Questions
- Series Questions
- Direction Questions
- Alphabet Test Questions
- Input Output questions
- Matrix Type Questions
- Symbol-Based Questions
- Other Reasoning Questions



## 6.1 Top Tips to Prepare for Logical Reasoning

1. You will get 40 questions in the Logical Reasoning section on the NMAT by GMAC™ that you will have to attempt in 38 minutes. You will have about 1 minute for each question.
2. This section will test you on two areas of Reasoning—Verbal Reasoning and Analytical Reasoning.
3. Read every part of the question carefully. Similarly, make sure you have looked at each answer choice before selecting your final answer. Even if you like an option at the first glance, make sure you have taken a look at all the remaining options as well before marking your answer.
4. NEVER assume or use any information that is not provided in the question. This section is not trying to assess your general knowledge or overall awareness. Consider ONLY the information given in each statement and use this to answer the question.
5. Pay special attention to words like 'all', 'some' or 'none' when you read the factual information provided in each question. Other qualifying words such as 'other than', 'only' or 'unless' are also important. These words can play a critical part in precisely specifying the facts that need to be used while reasoning.
6. Try to represent the given information pictorially, especially in arrangement questions, or as a Venn diagram in syllogism questions.
7. Logical Reasoning skills cannot be developed overnight, so make sure you spend a lot of time before the test practising Logical Reasoning questions and analysing your mistakes.



## 6.2 Verbal Reasoning

## 6.3 What is Measured?

The verbal reasoning section will test you on your ability to use logic to evaluate the strength of arguments, draw assumptions and inferences from statements, evaluate good and bad decisions and so on.

This section not only tests your understanding of English; it also tests your logical reasoning ability.

## 6.4 Overall Test Taking Strategies

- Logic does not mean common sense. So, do not use common sense or any outside information while answering questions. Only focus on the statement and options given to you.
- Read the question carefully and watch out for terms such as must, always, could, might, etc., as these could make a difference between a correct and an incorrect answer choice.
- Avoid extreme options in Inference questions.

The next few sections will provide you with in-depth strategies for approaching each topic.

# 1 Introduction

As the name suggests, Verbal Reasoning questions will, in part, test your language or comprehension skills. You will only be able to arrive at the correct answer if you are able to comprehend the argument or question correctly.

In the following sections, we will go through the various types of verbal reasoning questions along with the strategies for approaching each of them.

## 2 Argument Questions

In Argument questions, a statement (usually about some social, economic or political issue) will be given to you, and this statement will be followed by two or more arguments in favour of or against it. The question stem will then ask you to select which of these arguments is strong and which one is weak.

Strong arguments are those that are directly connected to the subject matter in the given statement and that help you strengthen or support that statement. Weak arguments, on the other hand, are either not connected to the subject matter at all or they are connected to it in a very indirect and far-fetched manner.

Argument questions typically give you the following five choices:

- (A) Only argument I is strong
- (B) Only argument II is strong
- (C) Either argument I or II is strong
- (D) Neither argument I nor II is strong
- (E) Both arguments I and II are strong

Let us take a look at an example:

**Statement:** Should mercy killing be legalised in India?

**Argument I** Yes. Mercy killing is already legalised in several other countries.

**Argument II** No. Given India's current social fabric, there is a high probability that the mercy killing provision might end up being misused by some people for their ulterior motives.

**Solution:** The stance of other countries with regards to mercy killing is not necessarily related to what India's stance on the matter should be, since the socio-cultural factors prevailing in those countries might be different from those prevailing in India. Thus, Argument I is a weak argument. Argument II, on the other hand, points out a genuine problem with regards to legalising mercy killing in the Indian context; therefore, Argument II is a strong argument.

**The correct answer is B.**

While attempting Argument questions, make sure you arrive at the answer based only on the information that is given to you in the statement and in the arguments. Do not allow your preconceived notions and biases on the subject matter in the statement come in the way of arriving at the logically correct answer.

### Questions with more than two arguments

It is not necessary that you will always get only two arguments in the question to choose from. You may even get four or five arguments with the question stem asking you to identify which of these are strong and which are weak.

Let us take a look at an example:

- Statement:** Indian students who have completed their education at public institutions in India, such as the IITs, should be banned from taking up jobs abroad as India gains nothing from their expertise.
- Argument I** Yes. This is the only way to sustain the high quality of teaching in Indian educational institutions.
- Argument II** No. Eventually most of these students come back to work in India and their experience of working abroad makes them more effective workers.
- Argument III** No. Students should be free to decide where they want to work.


- (A) Only argument I is strong  
 (B) Only argument II is strong  
 (C) Only arguments I and II are strong  
 (D) Only arguments I and III are strong  
 (E) All the arguments are weak

**Solution:** There is no real connection between the quality of teaching at Indian educational institutions and which country a student chooses to work in. Thus, Argument I is weak.

Argument II gives a strong and logical point against the view given in the statement by showing that the country may benefit in the long run. Thus, Argument II is strong.

Argument III does not address the point raised in the statement that the country gains nothing from the expertise of these students. Thus, Argument III is weak.

The correct answer is B.

 **Important Learning:** Do not use your own presumptions while answering Argument questions. Go only by the facts given to you in the statement.

### Tips for approaching argument questions

1. If the argument relies on some assumption, it is a weak argument. For example:

**Statement:** Should doctors be banned from carrying out private practice?

**Argument:** Yes. This will improve the quality of service in public hospitals.

**Explanation:** The above argument relies on the assumption that the cause of the poor quality of service in public hospitals at present is the fact that doctors are carrying out private practice. However, this assumption may or may not be true. Thus, this argument is a weak one.

2. If the argument gives someone's opinion, it is a weak argument. For example:

**Statement:** Should there be reservation for women in the Parliament?

**Argument:** No. The home minister does not think so.

**Explanation:** Just because the home minister does not believe in something does not mean that it is not the right thing to do. Thus, this argument is a weak one.

3. A word or phrase should be used to connote the same meaning in the statement and in the argument.  
For example,

**Statement:** Should there be a divorce between the judiciary and the legislature?

**Argument:** No. The judiciary and the legislature are not a married couple.

**Explanation:** The word 'divorce' is used in a different sense in the statement, whereas the argument is using the literal meaning of the word. Thus, this argument is a weak one.

Let us now take a look at one final example:

**Statement:** Should people below the age of 18 be allowed to drive?

**Argument I** No. People below the age of 18 do not have enough mental and physical maturity to drive a vehicle.

**Argument II** Yes. People of any age should be free to do what they want.

**Solution:** The first argument provides a valid reason why people below the age of 18 should not be allowed to drive. So, it is a strong argument. Argument II on the other hand just provides a random opinion without backing it up with any facts. Thus, it is a weak argument.

The correct answer is A.

### 3 Assumption Questions

An assumption is the most important part of any argument. Almost all arguments are based on some assumption or the other. The most important aspect of assumptions is that they are assumed, that is, they will never be written specifically in the question stem. They are always implicit in the argument and never explicitly stated. However, the assumption must be true for the argument's conclusion to be true.

In assumption questions on the NMAT by GMAC™, a statement will be given to you and two possible assumptions will be written below it. The answer choices will look something like this:

- (A) Only I is an assumption
- (B) Only II is an assumption
- (C) Either I or II is an assumption
- (E) Neither I nor II is an assumption
- (E) Both I and II are assumptions

Let us look at an example:

**Statement:** Since the CEO is going on a one-month leave, he has asked the CFO to take over the operations of the company for that period.

**Assumption I** The CFO has the necessary skills to run the company effectively.

**Assumption II** The CFO may not accept the request of the CEO.

**Solution:** If the CFO is being asked to take charge of the company, it is definitely implied that he has the skills to do so. Thus, Assumption I is a valid assumption. Whether the CFO accepts the offer or not is in no way implicit in the given statement. Thus, Assumption II is not a valid assumption.

The correct answer is A.

### Questions with more than two assumptions

You can even get questions with more than two assumptions in them. Let us take a look at an example:

**Statement:** Opening a movie theatre in Mahipur will be a loss-making venture.

**Assumption I** Residents of Mahipur do not like to watch movies.

**Assumption II** It is very expensive to set up a movie theatre in Mahipur.

**Assumption III** There will not be enough demand for the movie theatre's offerings in Mahipur.

- (A) Only I is an assumption
- (B) Only I and II are assumptions
- (C) Only II and III are assumptions
- (D) Only III is an assumption
- (E) None of them are assumptions

**Solution:** On the face of it, I looks like an assumption. However, there is nothing in the statement to suggest that the residents of Mahipur do not like to watch movies. It could be that the residents love watching movies, but the ticket prices are so high for this new theatre that they cannot afford it. Hence, I is not an assumption.


Again, II may or may not be the case. For example, it could be possible to set up the theatre with very little money, but the residents of Mahipur may just not be interested in watching movies in general.

III is definitely implied in the statement, as the only reason a venture turns loss making is if there is not enough demand for its products and services. The reason for this lack of demand could be anything. Thus, III is a valid assumption in the argument.

The correct answer is D.

### Tips for approaching assumption questions

1. Assumption must always be true.
2. Look out for words such as *only*, *best*, *always* and so on. These words reduce the chances of an option being a valid assumption.
3. Watch out for connecting words as they could show an implicit similarity, such as *similarly*, *likewise*, or a contrast, such as *yet*, *however*, *nonetheless*.
4. *Most* does not mean *all*.
5. *Many* does not mean *most*.

 **Important Learning:** The Assumption *must* be implicit in the given statement. If it *may* or *may not* be implicit, then it is not a valid assumption.

Let us look at one more example:

**Statement:** Organisations should promote people based only on their contribution to the company and not on the duration of their service within the company.

**Assumption I** The duration of service is not a reflection of the contribution that an employee has made to the company.



**Assumption II** It is possible to empirically measure the contribution that each employee has made to the company.

- (A) Only I is an assumption
- (B) Only II is an assumption
- (C) Either I or II is an assumption
- (D) Neither I nor II is an assumption
- (E) Both I and II are assumptions

**Solution:** Since the statement concludes that the length of service should not be the criteria used to determine whether to promote a person or not, it is obviously being assumed that there is no direct correlation between the length of service and the contribution an individual has made to the company. So I is an assumption. Again, when the statement concludes that promotions should be based on the contribution of each person to the organisation, it assumes that such contributions can be empirically measured. Thus, both the assumptions are implied in the argument.

The correct answer is E.

## 4 Inference Questions

An inference is the same as a conclusion. The one difference between the two, however, is that an inference is never explicitly stated in the statement. For example, if we say that *Chetan is the most intelligent student in his class*, then from this statement we can easily infer that Vivek, who studies in the same class, is not as intelligent as Chetan. Note that we have arrived at this inference even though Vivek is not explicitly mentioned anywhere in the statement.

The difficulty with inference questions is that we always have a tendency to over infer by reading too much between the lines or by using our own knowledge to answer questions. You must avoid doing these two things.

Here is how the answer choices typically look in an inference question:

- (A) Only I can be inferred
- (B) Only II can be inferred
- (C) Either I or II can be inferred
- (D) Neither I nor II can be inferred
- (E) Both I and II can be inferred

Let us take a look at an example:

**Statement:** Jogging is good for the health.

**Inference I** Walking is not good for the health.

**Inference II** All healthy people jog.

**Solution:** Just because jogging is good for health, it does not mean that walking or some other activity is not good for health. Thus, Inference I is not valid. Again, even though it is true that jogging is good for the health, it is not necessarily true that all healthy people jog. Some healthy people may be following some other exercise routine, for all you know. Thus, neither I nor II can be inferred from the statement.

The correct answer is D.

### Questions with more than two inferences

You can even get questions with more than two inferences associated with them. Let us take a look at an example:

- Statement: Most shoes available at the Broadway store are expensive.
- Inference I There are no cheap shoes available at the Broadway store.
- Inference II The Broadway store is overcharging its customers.
- Inference III Some of the shoes available at the Broadway store are not expensive.
- Inference IV People should avoid buying shoes from the Broadway store.


- (A) Only I can be inferred
- (B) Only II can be inferred
- (C) Only III can be inferred
- (D) Only I and III can be inferred
- (E) Only III and IV can be inferred

**Solution:** According to the statement, *most* shoes at the Broadway store are expensive. This does not mean that *all* the shoes are expensive. There may also be some cheap shoes available. In fact, there must be some cheap shoes available, or else the statement would have used the term *all* instead of *most*. Thus, I is not an inference in the argument and III is an inference in the argument.

We have no idea whether the Broadway store is overcharging its customers; thus, Inference II is incorrect.

Again, no one is asking us for our suggestion (implied by the use of 'should'); thus, IV is also not a valid inference.

The correct answer is C.

 **Important Learning:** While answering Inference questions, avoid selecting extreme or strongly worded options.

Let us look at one more example:

- Statement: From next year, students opting for the Science stream will be allowed to drop Physics and Chemistry from their core subjects.
- Conclusion I Students who were avoiding the Science stream due to their weakness in Physics and Chemistry can now study in the Science stream.
- Conclusion II Previously, students opting for the Science stream had to compulsorily study both Physics and Chemistry.

- (A) Only Conclusion I follows
- (B) Only Conclusion II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

**Solution:** The first inference can definitely be drawn from the statement, as these students may have earlier been avoiding taking up the Science stream for this reason. The second inference can also be drawn from the statement, because if the students are now being given a choice of dropping these two subjects, it means that earlier they did not have a choice. Thus, both the inferences are correct.

The correct answer is E.

## 5 Critical Reasoning

Critical reasoning questions will provide you arguments and you will be asked to find the assumption in these arguments, strengthen or weaken the arguments, or draw an inference from the arguments. To approach these questions correctly, you first need to know what makes up an argument.

Most arguments will have three parts: *Conclusion*, *Evidence* and *Assumption*.

Let's try to understand these terms with an example:

*People don't like to visit the Evergreen wildlife park in the rainy season. This year the park authorities have reconstructed all the roads inside the park, so people will like to visit the Evergreen Park in the rainy season this year.*

**Conclusion**—This is the point of the argument and answers the question *What*, that is, what is the argument basically stating—that *people would like to visit the Evergreen Wildlife park in the rainy season this year*.

Conclusions usually follow signalling words such as *thus*, *so*, *hence*, *therefore*, etc. In case there are no such words in the argument, try to paraphrase the entire argument in one line. This line would almost always be the conclusion of the argument.

**Evidence**—While the Conclusion tells you *What* the argument is saying, the Evidence tells you *Why* the argument is concluding what it is concluding. So in the above argument, why does the author conclude that people will like to visit the Evergreen Park this year? Because the park authorities have reconstructed all the roads inside the park, so this becomes your evidence.

Evidence usually follows signalling words such as *because*, *since*, *as a result of*, etc.

So the conclusion tells you the *what* of the argument and the evidence tells you the *why* of the argument. Another way of looking at conclusion and evidence is that a conclusion will almost always be an *opinion* whereas the evidence will almost always be a *fact*. In the above argument it is a fact that the roads have been reconstructed but it is the author's opinion that people will like to visit the Evergreen Park this year.

**Assumption**—Now, going back to the above argument, notice that from the given evidence we cannot necessarily arrive at the stated conclusion. The argument only states that people don't want to visit the Evergreen Park during the rainy season; it never states why people don't like to do so. So the author *assumes* that the only reason people don't like to visit the park is because of the poor road conditions within the park. If this is not assumed then the argument will fall apart.

For example, if the real reason why people do not visit the Evergreen Park was the fact that there are hardly any animals in the park, then even if the roads were of best quality, people will not visit the park because bad roads was not the reason for people not visiting the park in the first place. So, for the author to conclude that people will want to visit the park this year, he has to assume that the only reason people did not visit the park earlier was the poor road conditions inside the park.

So, now that you know what components make up an argument, let's look at the relation among these. All arguments will have the following structure:

$$\text{EVIDENCE} + \text{ASSUMPTION} = \text{CONCLUSION}$$

In essence, you can think of the assumption as unstated evidence or as a bridge between the evidence and the conclusion. If this bridge collapses, then you cannot arrive at the conclusion from the given evidence.

Here it is very important to note that the assumption is always *unstated* evidence, that is, it will never be written in the argument. It has to be assumed in the mind. So in a *find an assumption* question, if one of the options restates what is already mentioned in the argument, then this cannot be the assumption.

Now let us look at some common question types tested on Critical Reasoning.

### Find the assumption questions

As the name suggests, you will be given an argument in the question stem and you will need to identify the assumption that is made in this argument from the five options given to you. Let us take a look at an example:

**Example 1** Over the last six years, most of the students in Tupac city have regularly attended colleges in the neighbouring Mekon city to pursue their graduate degrees. However, according to a recent change in the education policies of Mekon city, the colleges in Mekon city are expected to increase their fees to almost the same level as those charged by colleges in Tupac city. Therefore, it can be safely concluded that colleges in Tupac city will see a surge in the number of students enrolling with them to pursue their graduate degrees.

Which of the following is an assumption on which the argument depends?

- (A) The teachers at colleges in Mekon city are generally considered far superior to those at colleges in Tupac city.
- (B) Tupac city does not have good quality colleges.
- (C) The low fees charged by colleges at Mekon city is the primary reason why students from Tupac city move to these colleges.
- (D) Students who study at colleges in Tupac city do not perform better than those who study at colleges in Mekon city.
- (E) Mekon city does not have more colleges than Tupac city.

**Solution:** Always start an assumption question by paraphrasing the conclusion and the evidence.

- **Conclusion (What is the author saying?)**—that there will be a surge in the enrolments at colleges in Tupac city.
- **Evidence (Why is the author saying this?)**—because students in Tupac city who earlier used to move to Mekon city to pursue their graduate degrees will now not do so as the colleges in Mekon city will charge them the same fees as the colleges in Tupac city do.
- Note that that conclusion is an opinion of the author but the evidence is a fact because the colleges in Mekon city are definitely looking at increasing their fees.
- **Assumption**—The author must be assuming that the low fees charged by colleges in Mekon city is the single most important factor why students from Tupac city have been moving to colleges in Mekon city. If we don't assume this, the argument will fall apart. Thus, C is the correct answer.

## Strengthen and weaken the argument questions

In these questions, an argument will be given to you and you will need to select from five options the one option which strengthens or weakens the argument (depending on what the question asks you to do). Let's take a look at an example of each:

- Example 2** Of all the laptops available for sale in Ireland, those manufactured by Ivy Infotech must have the fastest processors. Over the last six months, Ivy Infotech has sold three times as many laptops as its closest competitor. Additionally, Ivy Infotech's order books are full for the next 12 months.

Which of the following options, if true, most strengthens the argument?

- (A) Ivy Infotech is the oldest manufacturer of laptops in Ireland.
- (B) Ivy Infotech has the largest market share in laptop sales in Ireland for the past five years.
- (C) Ivy Infotech sources its processors from the company which is the world's biggest manufacturer of laptop processors.
- (D) All the laptops available for sale in Ireland are the same in every aspect, except for their processors.
- (E) Due to production bottlenecks, the production of laptops by Ivy Infotech's rival companies fell by more than 60% in the last six months.

**Solution:** Since this is a strengthen question, you know that the stimulus will be worded in the form of an argument. So the first step is to identify the conclusion and the evidence of this argument.

- **Conclusion (What is the argument stating?)**—Laptops manufactured by Ivy Infotech have the fastest processors.
- **Evidence (Why is the argument stating this?)**—Because Ivy Infotech has sold the maximum number of laptops in the last six months in Ireland.  
But does this make sense? Can't there be some other plausible reason why the people in Ireland are buying Ivy Infotech's laptops?
- Maybe these laptops have a very sleek design, maybe they have a very long battery life, or maybe they are the cheapest laptops in the market. There can be several other reasons (other than fast processors) why the Irish are buying laptops manufactured by Ivy Infotech. This brings us to the assumption. Remember that since the stimulus is in the form of an argument, it must contain an assumption.
- **Assumption (the unstated evidence)**—So let's try to predict the assumption. It will be something along the lines of 'the only difference among the different laptops available in Ireland is the speed of the processor; the laptops are the same in every other aspect', because then if the people are still buying Ivy Infotech's laptops then these laptops must have the fastest processors, else people would be buying some other company's laptops.
- **Strengtheners**—So now that we have identified the conclusion, the evidence, and the assumption, the option that best tells us that the assumption is true has to strengthen the argument. (D) does this best and should be the correct answer.
- **Weakeners**—Similarly, the option that best tells us that the assumption may NOT be true has to weaken the argument. In essence, this option will provide us with some other reason (other than fast processors) why the sales of Ivy Infotech's laptops have been very high. (E) does this best as it gives an alternative reason why people might be buying Ivy Infotech laptops—because the laptops of other brands are in short supply—and not because Ivy Infotech laptops have the fastest processors.

## Inference questions

Inference questions will ask you to infer or conclude something from the information given in the stimulus. The literal meaning of *infer* is to conclude something without it being explicitly mentioned. This is exactly what you are required to do on an Inference question—arrive at an option that is not explicitly stated in the stimulus but that can easily be concluded given the information in the stimulus. Let's take a look at an example of an Inference question:

**Example 3** Last month three automobile manufacturers—Honda, Toyota and Suzuki—launched new models of their respective sedans in Japan. The three models that were launched were similarly priced and had similar features. However the sales of Suzuki's new sedan have been far lower than those of Honda and Toyota's new sedans in the last month.

The statements above best support which of the following as a conclusion?

- (A) The people in Japan prefer cars manufactured by Toyota and Honda to those manufactured by Suzuki.
- (B) The people in Japan do not like cars manufactured by Suzuki.
- (C) Cars manufactured by Suzuki are notorious for their flimsy build quality and poor fuel efficiency.
- (D) In the last month, Suzuki has earned less revenue from the sale of its new sedan than Honda and Toyota.
- (E) Suzuki manufactures its cars primarily for the export market and not for domestic sale.

**Solution:** Do remember that the stimulus of an Inference question may not necessarily be in the form of an argument. In fact, most often the stimulus will contain a set of facts like the one above. All that the above stimulus tells us is that Honda, Toyota and Suzuki have each launched a new sedan last month and that the sales of Honda and Toyota's new sedans have been far greater than the sales of Suzuki's new sedan. These are all facts, and the author does not provide any conclusion on the basis of these facts.

With this background, let's go through each of the options in the above question and see if we can arrive at the correct answer:

- (A) This seems very obvious but such inferences must be avoided. For all you know Japanese people might actually prefer Suzuki cars the most but due to some supply constraints Suzuki's new sedan may not be available in the market.
- (B) The earlier explanation applies to this option as well. In fact this option goes a step further by concluding that Japanese people do not like Suzuki cars at all. Since this may or may not be the case, this cannot be the correct answer.
- (C) This looks very logical because it provides a very convincing reason why the sales of Suzuki's cars have been so low. But is that what we are supposed to do? Absolutely not. So this option does not even come close to being an Inference. It merely explains why the sales of Suzuki's new sedan may have been low but that is not what we are required to do in the argument.
- (D) The Correct answer. The argument tells us that the three new sedans are similarly priced. Then if Suzuki has sold fewer cars (and by a large margin) than Honda and Toyota, its revenues from the sale of this new sedan have to be lower than those of Honda and Toyota. This option must be true in all cases and hence has to be the correct answer.
- (E) Like option C, this option again provides a logical explanation for Suzuki's low sales in Japan but this may or may not be the case. In any case we are not required to provide an explanation in the first place. So this cannot be a valid inference.

## 6 Decision Making

In this question type, you will be given a statement followed by two courses of action or decisions. You will be required to analyze the situation and then decide which of the two decisions to take. The choices will typically read as follows:

- (A) Only I should be pursued
- (B) Only II should be pursued
- (C) Either I or II should be pursued
- (D) Neither I nor II should be pursued
- (E) Both I and II should be pursued

Let us take a look at an example:

**Statement:** The manager of a factory has a suspicion that two of the workers are stealing goods.

**Decision I** He should immediately fire the two workers.

**Decision II** He should search the two workers or find out in some other way whether they have actually stolen something.

**Solution:** The statement clearly states that this is just a suspicion that the manager has. It does not make any sense to fire two people just on the basis of a suspicion. So, Decision I is not a correct one. The manager should first investigate whether the workers have actually stolen anything and only then act against them. So, Decision II is the correct one to make.

**The correct answer is B.**

### Questions with three decisions to choose from

You can sometimes also get three decisions to choose from. Let us take a look at an example:

**Statement:** Workers shifting from villages to cities in large numbers, as has been observed recently, is an unhealthy trend.

**Decision I** Firms in cities should be barred from hiring rural workers.

**Decision II** It should be compulsory for workers in cities to also work in rural areas for some duration.

**Decision III** New schemes that can help generate employment in rural areas should be launched.

- (A) Only I should be pursued
- (B) Only II should be pursued
- (C) Only I and III should be pursued
- (D) All should be pursued
- (E) Only III should be pursued

**Solution:** Forcing someone to work in rural areas or barring rural workers from working in cities is definitely not a solution to the problem at hand. The solution is to try to understand why this migration is taking place in the first place—most likely because of better employment opportunities in the cities. So, the ideal solution should be to address this problem, which only III does.

**The correct answer is E.**

**Important Learning:** Make sure you arrive at an objective decision using only the facts given to you in the statement. Do not let your own knowledge or preconceived notions about the subject matter affect your decision making.

Let us take a look at one last example:

**Statement:** The Anti-Corruption Bureau (ACB) has received a complaint that a police inspector is asking for a bribe to close a case.

**Decision I** The ACB should wait for a few more complaints to come in before acting against the police inspector.

**Decision II** The ACB should immediately take action and try to catch the police inspector red-handed while taking the bribe.

- (A) Only I should be pursued
- (B) Only II should be pursued
- (C) Either I or II should be pursued
- (D) Neither I nor II should be pursued
- (E) Both I and II should be pursued

**Solution:** One incident of bribery should be good enough for the ACB to act against the police inspector. There is no reason why it should wait for more complaints to come in. Thus, Decision I is a not a logical decision. Decision II, on the other hand, makes perfect sense as the ACB should try to catch the inspector red-handed.

The correct answer is B.

## 7 Courses of Action

In this question type you will be given a statement followed by two courses of actions or decisions. You will be required to analyse the situation and then decide which of the two decisions to take. The options will typically read like this:

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Let us look at an example:

**Statement:** The manager of a factory has a suspicion that two of the workers are stealing goods.

**Decisions:** I. He should immediately fire the two workers.

**Decisions:** II. He should search the two workers or find out in some other way whether they have actually stolen something.



**Solution:** The statement clearly states that this is just a suspicion that the manager has. It doesn't make any sense to fire two people just on the basis of a suspicion. So Decision I is not a correct one. The manager should first investigate whether the workers have actually stolen anything and only then act against them. So Decision II is the correct one to make.

**The correct answer is B.**

You can sometimes also get three decisions to choose from. Let us look at an example:

**Statement:** The shift of workers from villages to cities in large numbers, as has been observed recently is an unhealthy trend.

**Decisions:** I. Firms in cities should be barred from hiring rural workers.

**Decisions:** II. It should be compulsory for workers in cities to also work in rural areas for some duration.

**Decisions:** III. New schemes that can help generate employment in rural areas should be launched.

- (A) Only I follows
- (B) Only II follows
- (C) Only I and III follow
- (D) All follow
- (E) Only III follows

**Solution:** Forcing someone to work in rural areas or barring rural workers from working in cities is definitely not a solution to the problem at hand. The solution is to try to understand why this migration is taking place in the first place—most likely because of better employment opportunities in the cities. So the ideal solution should be to address this problem, which only III does.

**The correct answer is E.**

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Introduction

Chapter 1

## 6.5 Analytical Reasoning

## 6.5 Analytical Reasoning

## 6.6 What is Measured?

The analytical reasoning section will include arrangement questions, syllogisms, codes and series, etc., and will test you more on your lateral thinking and visualisation skills.

This section is, to a large extent, testing your ability to make sense of incomplete or abstract text and images.

## 6.7 Overall Test Taking Strategies

- While attempting arrangement questions, focus on the overall arrangement and not on individual questions because once you get the arrangement right, the individual questions can be easily answered.
- Try to represent the given information pictorially or in the form of a Venn diagram.
- While attempting direction questions, remember the rules with regards to the direction in which a shadow falls at different times of the day.
- In symbols-based problems, try to focus on what is within each shape and not just on the shape.

The next few sections will provide you with in-depth strategies for approaching each topic.

# 1 Introduction

Unlike Verbal Reasoning, Analytical Reasoning questions will test you more on your logical and lateral thinking skills. You will need to make sense of random images, decode abstract text, understand symbols and so on.

Analytical Reasoning will include the following question types.

## 2 Linear and Circular Arrangements

Arrangement questions will require you to arrange a given set of people or objects in straight lines or in a circular manner. There will be a list of requirements or constraints given to you and you will need to make this arrangement keeping in mind these requirements.

Let us take a look at an example:

Ajay's work requires him to travel to cities C, R, G, J and B (each city for one day and not necessarily in this order) from Monday to Saturday, with a one-day break in the middle.

- i. He visits G neither on the first nor on the last day but he visits it earlier than R.
- ii. He visits J the day after he visits R.
- iii. He visits C immediately before the rest day.
- iv. J and B had a two day gap between their visits.
- v. He visited B immediately after the rest day.

1. Which of these is the rest day?
  - (A) Monday
  - (B) Tuesday
  - (C) Wednesday
  - (D) Thursday
  - (E) Friday
2. Between Monday and Saturday, the visits to J and C have how long a gap between them?
  - (A) One day
  - (B) Two days
  - (C) Three days
  - (D) Four days
  - (E) Five days
3. On which day does Ajay visit B?
  - (A) Monday
  - (B) Tuesday
  - (C) Wednesday
  - (D) Thursday
  - (E) Friday

4. Which of the following is a correct statement?
- (A) Ajay visits B on Wednesday
  - (B) Ajay visits J the day after he visits R
  - (C) Ajay visits C and B on consecutive days
  - (D) R is the last city that Ajay visits in the week
  - (E) The rest day is right in the middle of the week

**Solution:** We first need to decipher the days on which Ajay visits each of the five cities, as after doing so all the questions can be answered easily.

Start by looking at which cities Ajay can visit on Monday.

- G is out as it cannot be the first or the last city Ajay visits.
- Since R has to come before J, J cannot be the first city.
- B cannot be the first city since it comes after the rest day.
- J is out since Ajay visits J after he visits R.
- Thus, C has to be the city that Ajay visits on Monday.

As per the instructions in the question, C has to be followed by a rest day, which is in turn followed by B. So, we get:

Monday—C  
 Tuesday—Rest day  
 Wednesday—B  
 Thursday—?  
 Friday—?  
 Saturday—?

Since J and B have a two-day gap between their visits, we get:

Monday—C  
 Tuesday—Rest day  
 Wednesday—B  
 Thursday—?  
 Friday—?  
 Saturday—J

Since G has to come before R, the final order we get is:

Monday—C  
 Tuesday—Rest day  
 Wednesday—B  
 Thursday—G  
 Friday—R  
 Saturday—J

Using the above arrangement, the questions can now be easily answered.

1. (B)
2. (D)

3. (C)
4. (B)



**Important Learning:** The first step in Arrangement questions is always to figure out the correct placement of all the entities. The individual questions can be easily answered after that.

### Tips for approaching arrangement questions

1. The trick to solving Arrangement questions is to identify a person or an entity for whom more than one reference point is given in the question (e.g. J in the question we attempted above), and use this information to freeze this person's position. The other positions can then be fixed using this as a reference point.
2. It helps if you can visualise the correct arrangement or pattern in your head. In fact, it is even better if you can draw this pattern on paper to avoid confusion later.
3. Move to the answer choices only after you have read and understood the problem completely.
4. The problem has to be solved only on the basis of the given information. Do not assume any information which does not follow from the instructions in the question.
5. Watch out for words such as *all*, *some*, *none*, *only*, *unless* and so on, since questions will be based on the meaning conveyed by these words.

### Circular Arrangement

Let us now look at an example of a circular arrangement question:

P, Q, R, S, T, U, V and W are sitting around a circular table.

- i. P is second to the right of T who is the neighbour of R and V.
- ii. S is not the neighbour of P.
- iii. V is the neighbour of U.
- iv. Q is not between S and W. W is not between U and S. S is not between W and Q.

Questions:

1. Who is sitting to the right of U?
  - (A) P
  - (B) U
  - (C) R
  - (D) V
  - (E) Q
2. How many people are sitting between R and Q in a clockwise direction?
  - (A) 0
  - (B) 1
  - (C) 2
  - (D) 4
  - (E) 5

3. Who is sitting to the left of S?

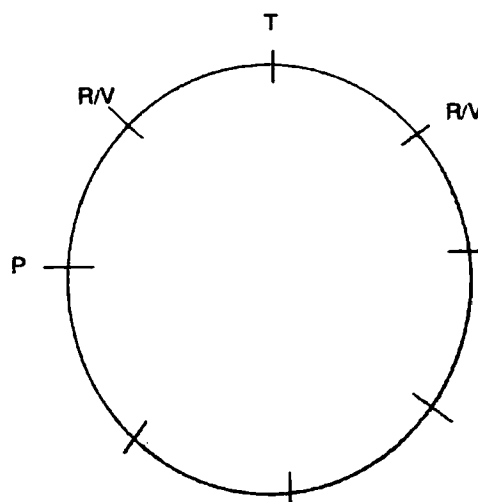
- (A) P
- (B) Q
- (C) W
- (D) R
- (E) T

4. Which of the following is the correct sentence?

- (A) T and S are neighbours
- (B) W and T have exactly three people between them
- (C) T and S have exactly two people between them
- (D) P and S are neighbours
- (E) W and S are not neighbours

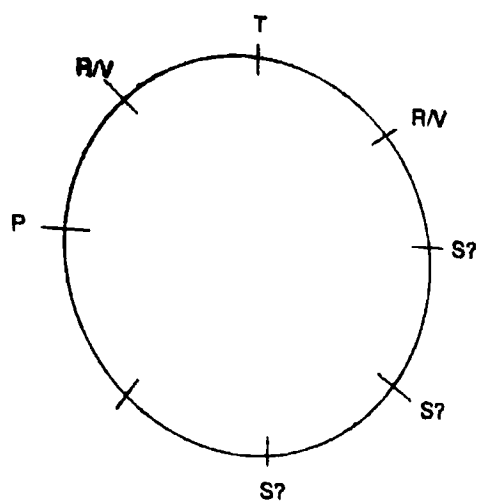
**Solution:** Let us first try to put all the eight people around a circular table based on the given instructions.

Using the information in Statement (i), we get:

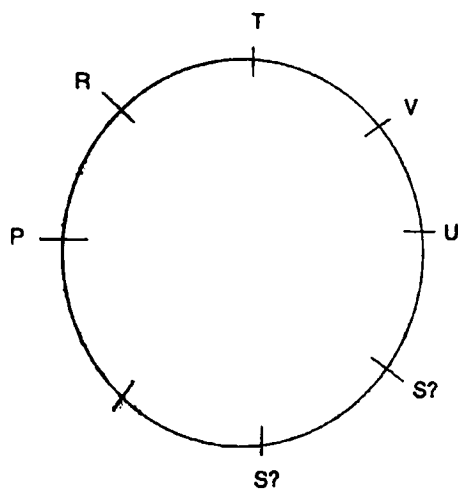


**Note:** Do not get confused with the lefts and rights. The right of T will be your left because all the people are sitting facing the table.

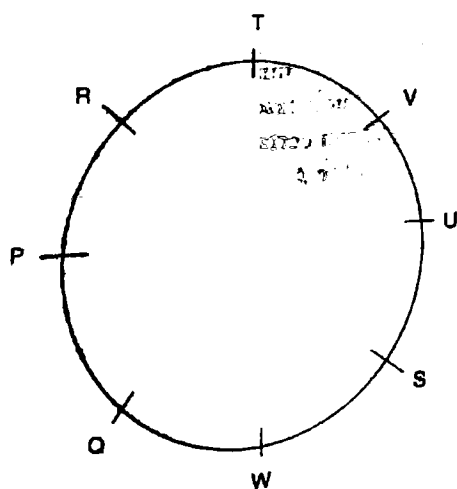
Using the information in Statement (ii) we get:



Using the information in Statement (iii) we get:



Using the information in Statement (iv), we finally get:



Using the above arrangement, we can now easily answer the questions.

1. (D)
2. (E)
3. (C)



4. (B) Note that irrespective of whether you go in the clockwise direction or in the anti-clockwise direction, the answer remains 3. However, the answer changes in the case of option (C), which is why (C) is incorrect as we do not know which direction to move in.

### 3 Syllogisms

A Syllogism is a logical proposition wherein a conclusion is arrived at using two or more quantified statements. You will typically be asked to determine whether this conclusion can logically be arrived at from the given statements or not. The primary difference between Syllogism questions and, say, Inference questions is that Syllogism questions will always use quantifiable terms such as 'all', 'none' and 'some'.

In Syllogism questions on the NMAT by GMAC™, you will be given two statements that will be followed by two conclusions. Your answer choices will be as follows:

- (A) Only conclusion I follows
- (B) Only conclusion II follows
- (C) Either conclusion I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

Let's look at certain concepts of Syllogism before approaching an actual Syllogism question:

- i. **Proposition:** Every syllogism question will contain two or more propositions. A proposition is nothing but a statement providing a relation between two terms. For example, *All men are mortals* is a proposition as it provides the relation between the terms *men* and *mortal*.
- ii. **Use of terms such as *Some* and *All*:** Almost every proposition will involve the use of words such as *some*, *all* and *no/none*. If a proposition says *All pens are pencils*, one can conclude that there will not be a single pen that is not a pencil. If a proposition says *Some pens are pencils*, then there could be some pens that are not pencils. If a proposition says *No pen is a pencil* then there is not a single pen that is a pencil.
- iii. **Use of the term *possibility*:** Sometimes, on Syllogism questions, you will come across the term *possibility* in one or more of the given conclusions. Possibility is an interesting term because it may or may not be true. For example, if the two propositions say *Some roses are violets* and *Some violets are jasmine*, then some roses could be jasmine. However, we cannot say this for sure because it is also possible that no rose is jasmine. In such cases, the conclusion *Some roses being jasmine is a possibility* is true because possibility does not mean certainty and there is definitely a possibility that some roses could be jasmine. You will typically see *possibility* being used in the answer choices when one or more of the propositions contain the word *some*.
- iv. **Answer choices on a Syllogism question:** In a typical Syllogism question, you will be given two statements (propositions), which will be followed by two conclusions. You will need to determine which of these two conclusions logically follows from the given statements. The answer choices will look like this:
  - (A) Only I follows
  - (B) Only II follows
  - (C) Only I and III follow
  - (D) All follow
  - (E) Only III follows

Note that the order of these answer choices might change but the wording of the five options will remain the same. While the remaining answer choices are self-explanatory, answer choice (C) *Only I and III follow* can be confusing at times. Usually, the correct answer will be from one of the other four answer choices. However, there is one situation in which (C) can be correct—*Complementary pairs*. Complementary pairs are two conclusions one of which must be true. For example, the conclusions *Some dogs are cats* and *No dog is a cat* are a complementary pair because one of the conclusions has to be true—either some dogs will be cats or no dog will be a cat. In such cases, the correct answer will be option (C).

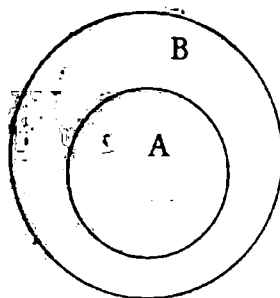
#### v. Usage of Venn diagrams to solve Syllogism questions

You can actually make use of Venn diagrams to answer Syllogism questions because representing the information given in the statements pictorially makes it less confusing.

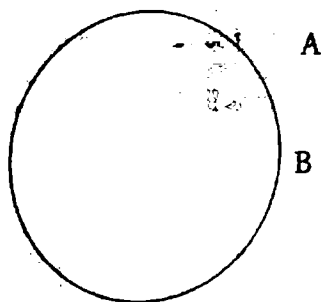
There are four major propositions in Syllogisms that can be represented using Venn diagrams. In all these propositions we will be referring to two entities—A and B—representing each by a circle.

i) *All A are B* – There are two ways of representing this:

a) The circle for A is completely within B.

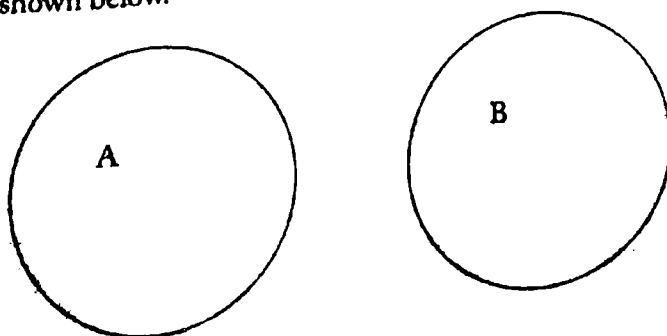


b) The circle for A and B is the same, that is, all B are also equal to A.

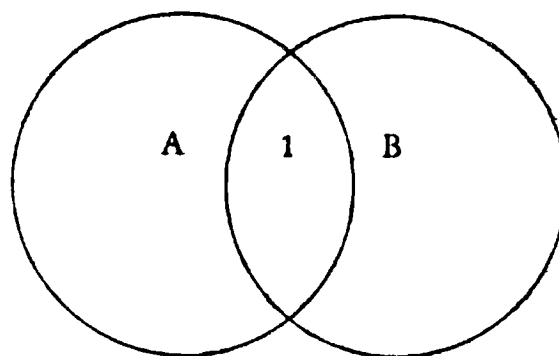


As you can see from the above diagrams, there could be some B that are not A as shown in the first figure. So, *all A are B* does not necessarily mean that *All B are A*.

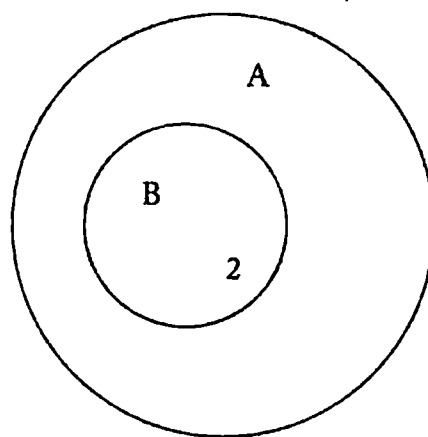
ii) *No A are B* – This is pretty simple. You simply draw two circles representing A and B with no overlap between them as shown below.



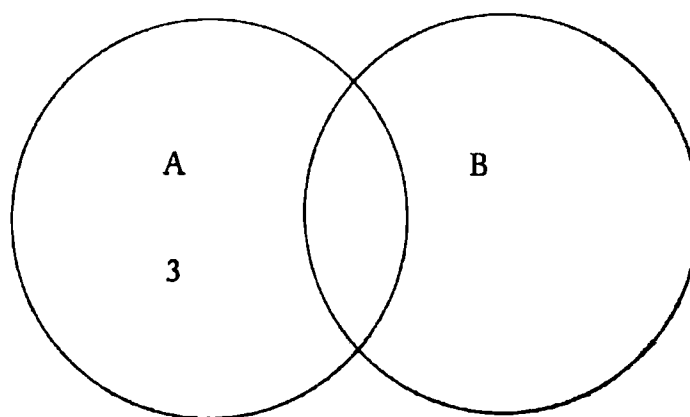
- iii) *Some A are B* – In this case we draw two circles with some intersecting part that represents the A which are also B. In the below figure, Number 1 represents the part where Some A are B.



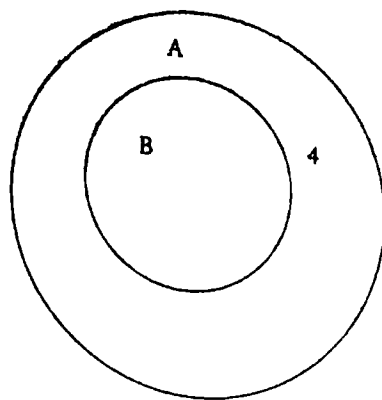
The information can also be represented in the below manner, with Number 2 representing the part where Some A are B.



- iv) *Some A are not B* – The Venn diagram for this proposition will look exactly the same as for the previous proposition—*Some A are B*. Just the region representing the proposition changes. In the below figure, Number 3 represents the A that are not B.



The information can also be represented in the below manner, with Number 4 representing the part where Some A are not B.



The above four Venn diagrams give you all possible ways of depicting propositions tested on Syllogism questions. However, note that on an actual Syllogism question, you will have two or more propositions (statements) given to you involving three or more entities. Thus, you will always end up making at least three circles.

Let us take a look at an example:

**Statements:** All dogs are animals. All animals are mortal.

**Conclusion I** All animals are dogs.

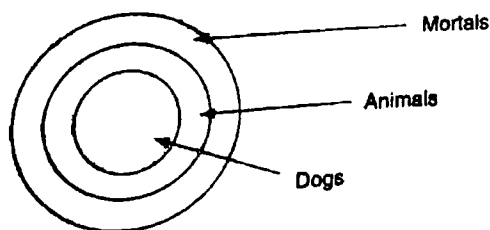
**Conclusion II** All dogs are mortal.

- (A) Only I follows
- (B) Only II follows
- (C) Only I and III follow
- (D) All follow
- (E) Only III follows

**Solution:** All dogs are animals, but this does not mean that all animals are dogs. There can also be other animals such as cats, horses and so on. Thus, Conclusion I is invalid. Conclusion II, on the other hand, is perfectly valid because if all dogs are animals and all animals are mortals, then all dogs must be mortals.

The correct answer is B.

It may be useful to draw Venn diagrams while answering syllogism questions. For example, in the above question, the answer becomes immediately obvious as soon as you make a Venn diagram, using the information given in the two statements, as shown in the following figure.



**Representation of the above question in the form of a Venn diagram**

**Important Learning:** If you come across a confusing syllogism question, try to represent the given information in the form of a Venn diagram and you will easily be able to arrive at the answer.

Let us take a look at another example:

**Statements:** All capitalists are rich. No Indians are capitalists.

**Conclusion I** No Indians are rich.

**Conclusion II** Some capitalists are Indian.

- (A) Only conclusion I follows
- (B) Only conclusion II follows
- (C) Either conclusion I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

**Solution:** The given statements never say that only the capitalists are rich. So, it is possible for Indians to be rich and yet not be capitalists. Thus, Conclusion I is invalid. Conclusion II clearly contradicts the fact given in the second statement. If no Indians are capitalists, then there is no way some capitalists can be Indians. Thus, Conclusion II is also invalid.

**The correct answer is D.**

You can also be tested on Syllogism questions with more than two statements and more than two conclusions. Let us take a look at an example:

**Statements:**

- (1) All the wires are cords.
- (2) All the cords are cables.
- (3) Some threads are cables.

**Conclusion I** Some cables are wires.

**Conclusion II** Some threads are cords.

**Conclusion III** All cords are wires.

- (A) Only I and II follow
- (B) Only I follows
- (C) Only II and III follow
- (D) All the conclusions follow
- (E) None of the conclusions follow

**Solution:** If all wires are cords and all cords are cables, then all wires are cables. So, some cables must be wires. Thus Conclusion I is correct.

All cords are cables does not mean that all cables are cords. Thus, there may be cables that are not cords and it could be these cables that the threads overlap with. So we cannot say for sure that some threads are cords. Thus, Conclusion II is not correct.

Similarly, all wires are cords does not mean that all cords are wires. Thus, Conclusion III is also not correct.

**The correct answer is B.**

## 4 Classification Questions

On Classification questions, you will be given five words/numbers/letters with some relations among three of them. You need to identify the word/number/letter that does not belong to this group. For this reason, these questions are also called spot the odd one out questions.

### Example 1

Four of the following are alike and form a group. Which one does not belong to this group?

- (A) Hen
- (B) Crocodile
- (C) Lion
- (D) Eagle
- (E) Lizard

**Solution:** Lion is the only mammal in the group.

The correct answer is C.

You can also get Classification questions based on meaningless letters. On such questions, look out for presence or absence of vowels from some of the combinations of letters.

### Example 2

Three of the following are alike and form a group. Which one does not belong to this group?

- (A) TYP
- (B) BCD
- (C) MNO
- (D) CJK
- (E) YLP

**Solution:** None of the other options contains a vowel.

The correct answer is C.

You can also get Classification questions based on numbers. On such questions, look out for odd and even numbers, prime numbers and divisibility rules for common integers.

### Example 3

Three of the following are alike and form a group. Which one does not belong to this group?

- (A) 123
- (B) 453
- (C) 625
- (D) 675
- (E) 870

**Solution:** All other numbers are divisible by 3.

The correct answer is C.

## 5 Family Tree or Blood Relation Questions

Questions on family tree will give you a list of relations among a group of people. You will be required to analyse these relations and identify how each of the members in the group is related to the others. You will then use this solution set to select the answers for the given questions. Let us take a look at an example:

Pointing to a girl, Rajesh said, 'She is the daughter of the only son of my mother'. How is Rajesh related to that girl?

- (A) Uncle
- (B) Father
- (C) Brother
- (D) Cousin
- (E) Grandfather

**Solution:** If Rajesh's mother has only one son, then that son has to be Rajesh himself. So, the girl must be Rajesh's daughter.

**The correct answer is B.**

Let's look at another example:

C is the wife of B's father's only son. J is the son of C. D is J's mother's father. How is B related to D?

- (A) Son
- (B) Grandson
- (C) Brother-in-law
- (D) Son-in-law
- (E) Nephew

**Solution:** B's father's only son has to be B. So, C is B's wife. This makes J the son of B and C. J's mother is C and C's father has to be B's father-in-law. Thus, B is D's son-in-law.

**The correct answer is D.**



**Important Learning:** The key to answering family tree questions correctly is to be aware of the various relations that exist between family members such as first cousin, second cousin, nephew, niece, grand-uncle and so on.

Here are some relations you should be aware of while attempting family tree questions:

- **Uncle**—the brother of one's father/mother OR the husband of one's aunt
- **Aunt**—the sister of one's father/mother OR the wife of one's uncle
- **First cousin**—the child of one's aunt or uncle
- **Second cousin**—the child of the first cousin of one's parents
- **Niece**—the daughter of one's brother or sister
- **Nephew**—the son of one's brother or sister
- **Grand-uncle**—the brother of one's grandfather
- **Brother-in-law**—the brother of one's spouse OR the husband of one's sister OR the husband of the sister of one's spouse

**Sister-in-law**—the sister of one's spouse OR the wife of one's brother OR the wife of the brother of one's spouse

## 6 Coding Questions

These questions require you to code or decode some common words such as city names. There will be a code given to you in the question stem and, using the knowledge of how this code has been created, you will need to create a code for the word given in the question stem.

Let us take a look at an example:

In a certain language, CHENNAI is written as DIFOOBJ. How will MUMBAI be written in this language?

- (A) NWNBCJ  
(B) NVNBCJ  
(C) NWNJCB  
(D) NVNCBJ  
(E) NVNCBK

**Solution:** It is easy to see how this code has been created. Each alphabet of the original word is replaced with the alphabet after that. So, C becomes D, H becomes I, E becomes F and so on. Using the same rule, (D) should be the code for Mumbai.

**The correct answer is D.**

### Common Codes + Coded sentences

Coding a message or a term means writing it in such a manner that it cannot be understood by anyone other than the person who knows the pattern underlying the code that can be used to decode the message.

## 1. Letter Coding

In these questions, the letters of the given word will be replaced by other letters. You will need to identify the pattern and answer the question accordingly. You can get two types of letter coding questions:

**Scramble-type coding:** In these questions the letters in the code are the same as those in the original word but their order changes, that is, the letters get scrambled or mixed up.

Example 1: In a certain code, MALICIOUS is written as ILAMCSUOI. How is ABANDONED written in that code?

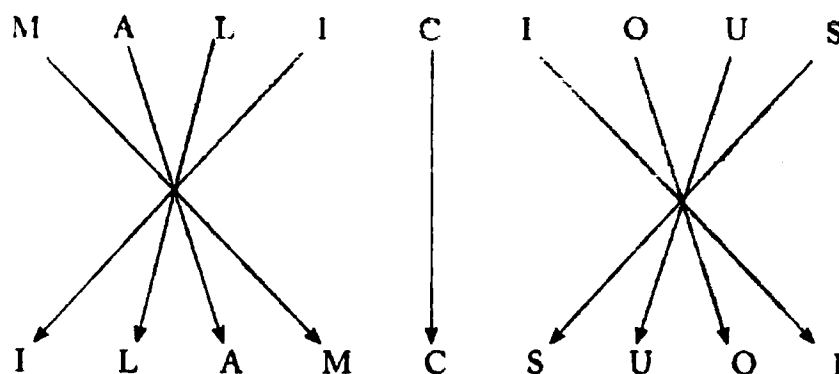
- (A) BADDENONA  
(B) ONABNDDAE  
(C) NBDDAENOA  
(D) NABADDENO  
(E) ENODDABNA

(E) ENODDABNA

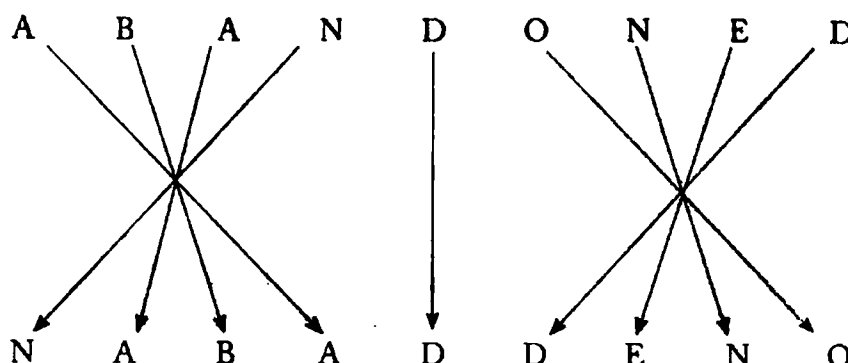
Solution: The first thing to do in letter coding questions is to check whether the question is a scramble type or replacement type. To do this, take a quick look at the given code. If the letters in the code match the letters in the original word, then you are looking at a replacement or substitution type code. In this question, you see new letters in the code, you are looking at a scramble type code. The best way to do this is to match the letters in ILAMCSUOI with those in MALICIOUS, so we know we are looking at a scramble type code. It is now a simple matter of identifying how these positions are changing. The best way to do this is to write the original word and its code in front of each other in this manner:

429





Using the same arrow marks, the code for ABANDONED should be



Thus, option (D) is correct.

The correct answer is D.

**Replacement-type coding:** In these codes, the letters in the original word are replaced with new letters according to a fixed pattern. You need to identify this pattern to crack the code.

**Example 1:** In a certain code, VERITY is written as TCPGRW. How is FELON written in that code?

- (A) JCDML
- (B) DJCML
- (C) DCJML
- (D) MCJDL
- (E) DMCJL

The correct answer is C.

**Solution:** Just as we did for the previous question, write the original word and the coded word in front of each other and see if you can identify some relation between each of the letters.

V - 2 places = T  
 E - 2 places = C  
 R - 2 places = P  
 I - 2 places = G  
 T - 2 places = R  
 Y - 2 places = W

Following the same rule, the code for FELON should be:

F - 2 places \_\_\_\_\_ = D

E - 2 places \_\_\_\_\_ = C

L - 2 places \_\_\_\_\_ = J

O - 2 places \_\_\_\_\_ = M

N - 2 places \_\_\_\_\_ = L

Thus, the answer is DCJML.

Some common methods used in Replacement-type coding are:

- Moving a letter forward – ADAM becomes BEBN
- Moving a letter backward – HEN becomes GDM
- Moving odd letters a step forward with no change in the even letters – BOTTLE becomes COUTME.
- Moving odd letters a step forward with even letters a step backward or vice versa – BOTTLE becomes CNUSMD.
- Reversing the letters – PHONE becomes ENOHP

## 2. Number Coding

In number coding, the letters in the given word are replaced by numbers in the code based on a certain pattern. You need to identify this pattern and answer the question accordingly. Here, keep in mind that the most common way of replacing letters with numbers is to use the position of the letter in the English alphabet series. For example, A can be replaced with 1, B with 2, Z with 26 and so on.

**Example 1:** In a certain code, BEDLAM is coded as 25412113. How is CONMAN written in that code?

- 3511413114
- 3151413114
- 3151431114
- 3151413141
- 3511411314

**Solution:** In number coding questions, always try to use the position of the letter in the English alphabet series to crack the code. You will almost always manage to find the numbers connected in some way to the respective positions of the letters in the alphabet series. As a first step, replace each letter in the code with its position number in the alphabet series.

B - 2

E - 5

D - 4

L - 12

A - 1

M - 13

Thus, we have a straightforward code where each letter is replaced by its corresponding number in the English alphabet series.

Using the same rule, the code for CONMAN should be:

C – 3

O – 15

N – 14

M – 13

A – 1

N – 14

Thus, the answer is 3151413114

The correct answer is B.



**Important Learning:** If the letters in the options are the same as those in the original word, you are looking at a Scramble-type code.

## 7 Series Questions

In Series questions, you will be given a series of numbers or letters with some relation between all the terms in the series. You will need to identify this connection in the series of numbers to find the next item in the series.

Let us take a look at an example:

Which of the below options would come next in this series of numbers?

1, 4, 9, 16, 25, \_\_

(A) 29

(B) 33

(C) 36

(D) 49

(E) 64

**Solution:** It can be easily observed that the given series is a list of squares of all numbers starting from 1 ( $1^2 = 1$ ,  $2^2 = 4$ ,  $5^2 = 25$ ). So, the next term in the series should be  $6^2 = 36$ .

The correct answer is C.

Let's look at another example:

What should be the next term in the series 2, 3, 6, 6, 10, 9, 14, 12, \_\_\_\_?

(A) 12

(B) 15

(C) 18

(D) 20

(E) 21

**Solution:** This is an alternating series in which the terms at odd and even positions follow different rules.

Odd terms

Starting with 2, you get the next term by adding 4 to the previous term at an odd position. So, 2,  $(2 + 4 =) 6$ ,  $(6 + 4 =) 10$  and so on.

Even terms

Starting with 3 you keep going up in multiples of 3 at every subsequent even position. So, 3, 6, 9, 12 and so on.

Since the next term is at an odd position, it will be equal to  $14 + 4 = 18$ .

The correct answer is C.

### Some commonly tested series

- Addition series—5, 8, 11, 14, 17, \_\_
- Subtraction series—50, 45, 40, 35, 30, 25, \_\_
- Product series—2, 4, 8, 16, 32, 64, \_\_
- Square series—1, 4, 9, 16, 25, 36, 49, \_\_
- Cube series—1, 8, 27, 64, 125, \_\_
- Fibonacci series—0, 1, 1, 2, 3, 5, 8, \_\_

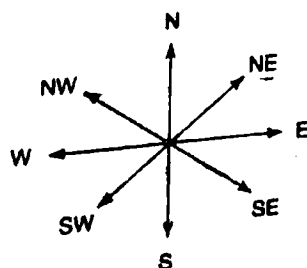
### Tips for approaching series questions

1. If the series is increasing gradually, that is, the gap between successive terms is not very large, you are most likely looking at an addition-based series.
2. If the series is increasing rapidly, that is, the gap between successive terms is very large, you are most likely looking at a multiplication-based series.
3. If the gap between successive terms keeps on increasing as you move ahead in the series, you are most likely looking at a series involving squared or cubed numbers.
4. If the series looks very haphazard or random, there may actually be two series within one. For example, the odd integers might be following one pattern and the even integers might be following a different pattern.

**Important Learning:** If a series increases gradually, it is most likely addition-based, and if it rises rapidly, it is most likely multiplication-based.

## 8 Direction Questions

Questions on directions would involve reasoning based on the eight directions on a map—north, northeast, east, southeast, south, southwest, west and northwest. These are illustrated in the following figure.



The eight common directions

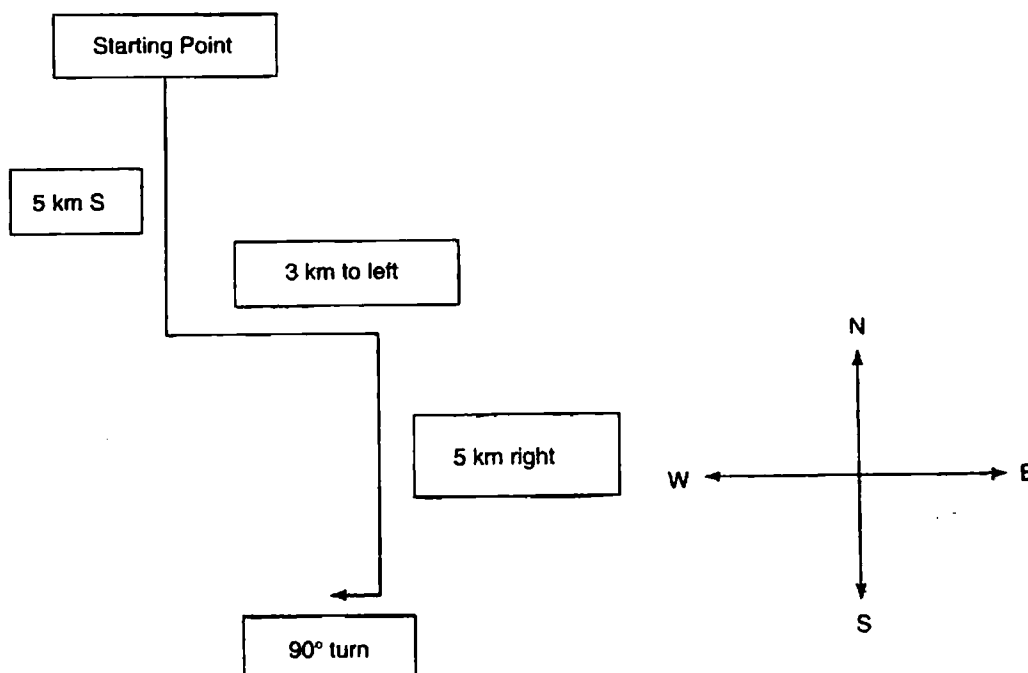
It helps to have some sense of direction while answering these questions. For example, you should know which direction you will be facing if you turn  $45^\circ$  or  $90^\circ$  from your current position. It also helps if you can create a diagram based on the instructions given to you in the question.

Let us take a look at an example:

A man walks 5 km to the south and then turns left. He then walks for 3 km before turning right. He walks 5 km and turns 90 degrees in the clockwise direction. Which direction is he facing at the end?

- (A) South
- (B) East
- (C) Northeast
- (D) West
- (E) Southwest

**Solution:** Let us draw a figure based on the given instructions. It would look something like the following figure. Remember that clockwise means from right to left, so taking a  $90^\circ$  clockwise turn is the same as taking a right turn.



The correct answer is D.



**Important Learning:** Turning  $90^\circ$  clockwise means turning right and turning  $90^\circ$  anti-clockwise means turning left.

### Tips for approaching direction questions

- (a) At the time of sunrise,
  - i. if a man's shadow is behind him, he is facing east
  - ii. if a man's shadow is to the left of him, he is facing north

- iii. if a man's shadow is to the right of him, he is facing south
- iv. if a man's shadow is in front of him, he is facing west

(b) At the time of sunset,

- i. if a man's shadow is behind him, he is facing west
- ii. if a man's shadow is to the left of him, he is facing south
- iii. if a man's shadow is to the right of him, he is facing north
- iv. if a man's shadow is in front of him, he is facing east

(c) At 12 noon, the rays of the sun are vertically overhead, and so there will be no shadows.  
Let's look at an example of a shadow-based question:

A and B are having a face-to-face conversation in the evening. If A's shadow falls in front of him, which direction is B facing?

- (A) South
- (B) Northwest
- (C) North
- (D) East
- (E) West

**Solution:** In the evening, if your shadow falls in front of you, you are facing the east direction. So, A is facing east. Since B is facing A, he must be facing west.

The correct answer is E.

## 9 Alphabet Test Questions

As the name suggests, Alphabet test questions will test you on the English alphabet series. Before we look at the various types of questions you can get in this topic, let's review a few alphabet related concepts.

- i. There are 26 letters – A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
- ii. Ranking of letters in the English alphabet series

*From left to right*

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

*From right to left*

A	B	C	D	E	F	G	H	I	J	K	L	M
26	25	24	23	22	21	20	19	18	17	16	15	14
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
13	12	11	10	9	8	7	6	5	4	3	2	1

## iii. Opposite of each letter in the English alphabet series

A	B	C	D	E	F	G	H	I	J	K	L	M
↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Z	Y	X	W	V	U	T	S	R	Q	P	O	N

- iv. There are 5 vowels – A E I O U
- v. There are 21 consonants – B C D F G H J K L M N P Q R S T V W X Y Z
- vi. When the question stem says *to the right*, you have to move from left to right, that is, from A to Z
- vii. When the question stem says *to the left*, you have to move from right to left, that is, from Z to A
- viii. When the question stem says *from the right*, you have to move from right to left, that is, from Z to A
- ix. When the question stem says *from the left*, you have to move from left to right, that is, from A to Z

## Commonly Tested Alphabet Test Question Types

One important thing to keep in mind while attempting Alphabet test questions is that these are primarily observation-based questions, that is, most of the time you will not really have to solve anything. You will need to observe the letter arrangement that is given to you and answer questions from this. Let's look at some question types that usually appear in the Alphabet test:

1. **Position based questions:** These questions will test you on the position of different letters within the English alphabet system or within a letter arrangement that is given in the question stem.

**Example 1** Which letter will come exactly between the tenth letter from the left and the seventh letter from the right in the English alphabet series?

- (A) N
- (B) O
- (C) P
- (D) Q
- (E) R

**Solution:** In the English alphabet series, the 10th letter from the left is J and the 7th letter from the right is T. The letter midway between J and T is O, which is the answer.

The correct answer is C.

2. **Vowel-Consonant type questions:** In these questions, you will be given an arrangement of letters containing a mix of vowels and consonants. The questions will be based on certain arrangements or patterns of these vowels and consonants.

**Example 1** In the letter arrangement given below, how many vowels are preceded by a consonant and followed by a vowel?

DTU H J K I U G N R F E W B K L Z O A N F T G D E R O P L U J H Y G

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) More than 4

**Solution:** In such questions, starting from one end of the arrangement (ideally the left end because we read from left to right), look for the vowels. The first vowel you will encounter is U (DTU/H....). Now check whether it satisfies the criteria given in the questions. While U is preceded by a consonant (T), it is not followed by a vowel. Thus, it cannot be part of the answer. Similarly moving right, come to the next vowel – I (K/UG). I is preceded by a consonant (K) and also followed by a vowel (U). Thus, I is part of the answer. Once again, remember not to underline these terms in your book. What you should do instead is write the entire group of three terms (the vowel, the consonant preceding it and the vowel succeeding it) in your rough sheet (KIU) so that, in case you want to double check your work, you don't have to waste time finding the vowels once again in the given arrangement. Keep moving till the end of the arrangement in the same manner. Your final answer set should look like this: KIU ZOA.

Thus, there are two vowels that satisfy the criteria given in the question.

The correct answer is B.

**3. Make-a-meaningful-word questions:** In these questions, you will be asked to make one or more meaningful word(s) from a given set of letters. These letters could be given to you in isolation or as part of a bigger arrangement.

**Example 1** If it is possible to form just one meaningful word using the letters A F E C, the third letter of that word is your answer. If more than one such word can be made, your answer is 'M' and if no such word can be made, your answer is 'X'.

- (A) F
- (B) C
- (C) E
- (D) M
- (E) X

**Solution:** In such questions, you need to draw upon your knowledge of English words, though the words given to you are usually short, containing only four or five letters. Using the alphabets A F E and C we can actually make two meaningful words – FACE and CAFE. Thus, as per the instructions in the question, the answer has to be M.

*Note: The use of the term 'meaningful' in the question stem is very important because the words that you make need to have some meaning. For example, a choice such as FEAC does not work in the above question because it has no meaning.*

The correct answer is D.

**Rule-based questions:** In these questions, you will be given a meaningful English word and you will be asked to base your answer on specific conditions or rules given in the questions.

**Example 1** How many such pairs of letters are there in the word BAROMETER each of which has as many letters between them, (in both forward and backward directions) in the word as they have in the English alphabetical series?

- (A) None
- (B) 1
- (C) 2
- (D) 3
- (E) More than 3



**Solution:** In these questions, you need to check various combinations of letters (with reference to the gap between them) as they appear in the given word as against their positions in the English alphabet series. Let's start from the two most left letters: BA. The gap between them is zero (since they come right next to each other). If you look at the position of BA in the English alphabet series, it is still zero because even in the alphabet series they come together.

Thus, BA is one possible answer so jot it down on your rough sheet. Here note that the order of the two letters (that is which comes first in the given word) does not matter since the question stem clearly says that you can move forward or backward.

Now look for the next combination – BR. In the given word, there is a gap of one letter between B and R whereas in the English alphabet there is a much bigger gap (don't bother calculating this gap because it is obvious that this gap is more than 1 letter). Thus, BR cannot be the answer.

Similarly, now try BO, BM and so on. Once you reach the last combination with B that is BR, you need to start making combinations with A, that is, AR, AO and so on.

Your final answer set will look like this: BA, AROME (gap of 3 letters between A and E, same as in the English alphabet series), TER (gap of 1 letter between T and R, same as in the English alphabet series). Thus, the answer is three.

The correct answer is D.

## 10 Input-Output Questions

Input-Output is a question type in which you are given a word and number arrangement. With each subsequent operation, the arrangement of the words and numbers changes. These operations are performed until a final arrangement is reached or is performed in a loop. You are required to identify the hidden pattern in the rearrangement and apply it to the questions asked.

Let's take a look at an example

**Input:** go now 53 39 18 for again 66  
**Step 1:** 66 go now 53 39 18 for again  
**Step 2:** 66 again go now 53 39 18 for  
**Step 3:** 66 again 53 go now 39 18 for  
**Step 4:** 66 again 53 for go now 39 18  
**Step 5:** 66 again 53 for 39 go now 18  
**Step 6:** 66 again 53 for 39 go now 18  
**Step 7:** 66 again 53 for 39 go 18 now

As per the rule followed in the above arrangement, attempt the following question.

**Input:** chicken wand 24 44 57 Hexa bleach 71

How many steps will be required to complete the rearrangement of the above input?

- (A) Three
- (B) Four
- (C) Five
- (D) Six
- (E) Seven

**Solution:**

The trick to solving Input-Output questions is to first try and identify the structure in the original input-output table given to you. In this question, you will notice that the numbers in the input get arranged in descending order whereas the words get arranged as per their order in the English dictionary. Also note that each step is moving one number or one word such that they alternate with each other, starting with the number. Now, we can apply this same logic to the input given to us in the above question. Here are the steps accordingly:

Step 1: 71 C W 24 44 57 H B  
 Step 2: 71 B C W 24 44 57 H  
 Step 3: 71 B 57 C W 24 44 H  
 Step 4: 71 B 57 C 44 W 24 H  
 Step 5: 71 B 57 C 44 H 24 W  
 Step 6: 1 B 57 C 44 H 24 W

Thus the correct answer is 6 steps, that is, Option D.

The correct answer is D.

### Tips for Input-Output questions

- Usually the first, second and final steps of the arrangement are enough to identify the pattern
- If there are 'n' words/digits in the input then at most 'n-1' steps are required to rearrange it completely

## 11 Matrix Type Questions

Matrix test questions are a form of coding question in which some numbers and their corresponding alphabetical codes are given in the form of two matrices. A word will be given to you in the question and you will need to identify its code from the given matrices.

### Example 1

A word is represented by only one set of numbers as given in either of the matrices below. The columns and rows of Matrix I are numbered from 0 to 4 and the columns and rows of Matrix II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, e.g., A can be represented by 03, 10, etc. Similarly, you have to identify the set for the word, TEAK.

Matrix I

	0	1	2	3	4
0	C	B	O	A	T
1	A	C	T	B	O
2	B	O	A	T	C
3	T	C	B	O	A
4	O	A	T	C	B

**Matrix II**

	5	6	7	8	9
5	R	E	K	D	L
6	D	L	R	E	K
7	E	K	D	L	R
8	L	R	E	K	D
9	K	D	L	R	E

- (A) 04 10 87 57  
 (B) 30 76 75 22  
 (C) 42 75 22 88  
 (D) 23 88 10 75  
 (E) 75 42 88 22

**Solution:**

Option A: TA, so leave this

Option B: TK, so leave this

Option C: TEAK, so the correct answer

The best way to answer these questions is to quickly go through all the answer choices and check which one gives the correct answer. However, in order to save time, do not go through all the answer choices completely. The moment you come across a word in the matrix that does not match with the given word, skip this answer choice and move to the next one.

The correct answer is C.


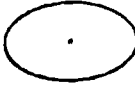

## 12 Symbol-Based Questions

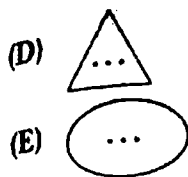
These questions will be similar to the series-based questions we saw earlier. The only difference between them is that, while in series-based questions we were dealing with numbers or letters, in symbol-based problems we are dealing with abstract symbols. You will be given a series of symbols and you will be asked to select the next symbol in that series from the given options.

Let us take a look at an example:



Which of the following should be the next symbol in the above series?


- (A)   
 (B)   
 (C) 



**Solution:** It is clear from the given pattern that the order of the shapes has to be square, oval, triangle, square, oval and so on.

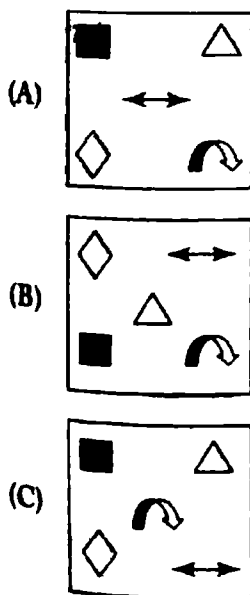
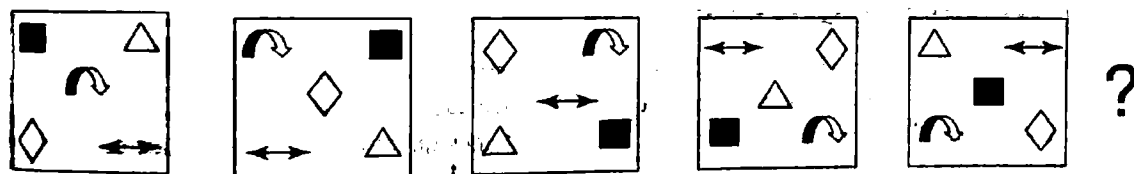
Thus, the next shape has to be a square. This brings us to (A) and (C). Now, look at the number of dots within each shape in the question stem. This number keeps going down by one until it reaches 1, and then it starts to increase by one. So, the number of dots in the next symbol should be  $(2 + 1 = 3)$ . Thus, option (C) is the correct answer.

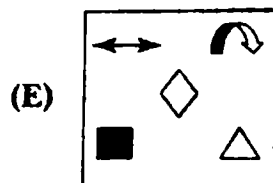
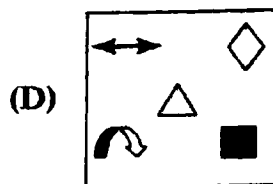
The correct answer is C.

 **Important Learning:** Do not just focus on the shape of the given figures. Also, pay attention to what is contained within those figures (such as dots in the question we saw above).

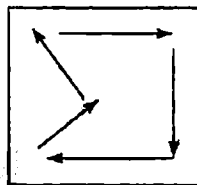
Let us take a look at another example:

From the answer choices select the figure that will continue the series as established in the five problem figures.





**Solution:** The symbols within each box move in the following order:

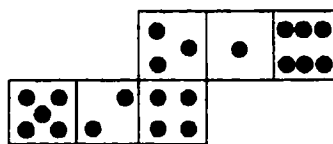


The correct answer is C.

## 13 Other Reasoning Questions

Apart from the question types we have seen so far, you can sometimes also get questions on the NMAT by GMAC™ that fall under the miscellaneous category, since each of these questions is different in its own right. These could include input-output questions, matrices questions, and questions requiring you to visualise three-dimensional figures. Let us take a look at examples of some of these questions:

**Example 1** How many dots lie opposite the face having six dots, when the given figure is folded to form a cube?



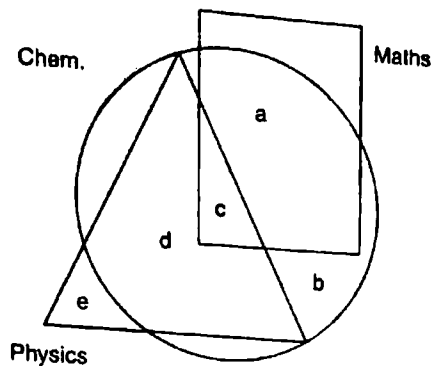
- (A) One
- (B) Two
- (C) Three
- (D) Four
- (E) Five

**Solution:** When the figure is folded to form a cube, 6 and 3 will be opposite; one and two will be opposite; four and five will be opposite. Thus, the correct answer is (C).

The correct answer is C.

**Example 2**

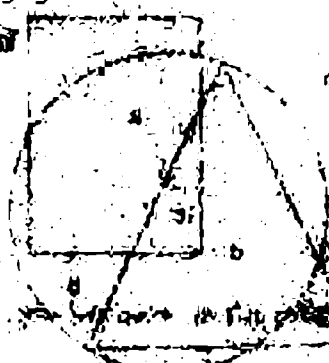
In a group of students, Chemistry majors are represented by a circle, Mathematics majors by a rectangle and Physics majors by a triangle. Which letter represents students who are majoring in all three subjects?



- (A) a
- (B) b
- (C) c
- (D) d
- (E) e

**Solution:** From the figure, it is clear that (c) is the only area where all three figures intersect. Thus, it has to be the correct answer.

The correct answer is C.



## 7.0 Logical Reasoning Practice

## 7.1 Practice Questions

Solve the following questions and indicate the best of the answer choices given.

Questions 1–6 consist of a statement followed by two arguments numbered I and II. Decide which of the arguments is strong. Select from the following options.

- (A) Only argument I is strong
- (B) Only argument II is strong
- (C) Either argument I or II is strong
- (D) Neither argument I nor II is strong
- (E) Both arguments I and II are strong

1. **Statement:** Should exemptions be provided to industries that are set up in underdeveloped areas.

**Argument I** No. The only goal of these industries is to maximise profits.

**Argument II** Yes. This will help generate employment in backward areas.

2. **Statement:** Should taxes, especially those on income, be abolished in India?

**Argument I** No. This is an important source of funds for the government to spend on development of infrastructure and so on.

**Argument II** Yes. This provides no benefits to the people who pay these taxes.

3. **Statement:** Should export of essential items, such as wheat, be banned from India?

**Argument I** Yes. The first right on the use of these items is of the people of India.

**Argument II** No. Other countries might retaliate and ban the export of some of their products to India.

4. **Statement:** Should all the illegal construction that has been carried out in the city by unscrupulous builders be demolished?

**Argument I** Yes. This will dissuade such builders from carrying out such activities in future and also punish people for buying such properties.

**Argument II** No. There are people living in these buildings who will have nowhere to go.

5. **Statement:** Should India spend resources on developing renewable sources of energy, such as solar and wind, to meet its energy needs?

**Argument I** Yes. The current sources of energy will eventually get completely used up.

**Argument II** No. India will have to spend a huge amount of money on developing these sources of renewable energy.

6. **Statement:** Has the easy availability of consumer loans made life easier for the Indian consumer?

**Argument I** Yes. The consumers can now buy items that they couldn't afford earlier.

**Argument II** No. The easy availability of these loans can make consumers buy unnecessary things.

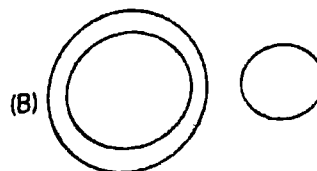
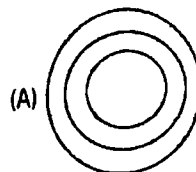
7. Study the matrices and determine the digits that comprise the given word.

	0	1	2	3	4
0	P	L	E	B	N
1	U	C	E	M	E
2	N	V	A	R	Y
3	Y	I	F	Y	S
4	R	M	C	U	E

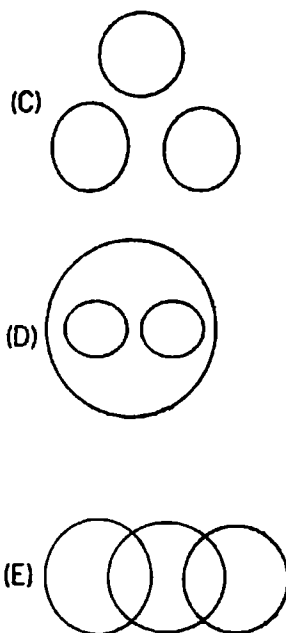
	5	6	7	8	9
5	A	G	L	R	W
6	I	Y	K	F	M
7	U	L	Y	U	I
8	L	S	P	T	P
9	N	Y	A	C	L

### LUMINARY

- (A) 75, 78, 14, 31, 40, 22, 40, 96
  - (B) 85, 78, 13, 79, 04, 97, 58, 97
  - (C) 76, 10, 41, 31, 14, 22, 23, 77
  - (D) 85, 78, 13, 32, 04, 97, 58, 33
  - (E) 85, 78, 13, 79, 04, 97, 58, 33
8. Which of the following diagrams indicates the best relation between tea, coffee and beverages?







**Directions for Questions 9–10:** Each question given below consists of a statement, followed by two arguments numbered I and II. You have to decide which of the arguments is a 'strong' argument.

Select from the following options:

- (A) Only argument I is strong
- (B) Only argument II is strong
- (C) Either argument I or II is strong
- (D) Neither argument I nor II is strong
- (E) Both arguments I and II are strong

9. **Statement:** Should diesel vehicles be banned from plying in Delhi?

**Argument I** Yes. This is very important to check the rising pollution levels in Delhi, since diesel vehicles are a major contributor to air pollution.

**Argument II** No. All essential commodities required by citizens of Delhi are transported by diesel vehicles, so banning these vehicles will lead to a rise in the price of such items.

10. **Statement:** Should international movies be banned from releasing in India?

**Argument I** Yes. Such movies destroy Indian culture by enticing the youth to follow an alien culture.

**Argument II** No. Most such movies have won international awards.

11. Study the matrices and determine the digits that comprise the given word.

	0	1	2	3	4
0	T	A	E	B	J
1	S	B	R	U	E
2	D	V	T	R	L
3	J	P	B	Y	S
4	N	I	J	U	E

	5	6	7	8	9
5	J	G	W	A	L
6	A	Z	K	F	E
7	J	B	I	T	I
8	P	U	P	U	N
9	L	A	G	C	T

### JUBILANT

- (A) 55, 86, 32, 41, 24, 01, 41, 99
- (B) 40, 13, 76, 79, 24, 01, 40, 00
- (C) 41, 13, 76, 14, 24, 01, 40, 00
- (D) 75, 88, 76, 77, 59, 96, 88, 99
- (E) 42, 13, 76, 79, 24, 01, 40, 00

12. A statement is followed by two conclusions, numbered I and II. On the basis of the information given in the statement, decide which of the conclusions can be drawn logically from the given statement.

**Statement:** Canadian steel is harder than the steel produced in most other countries across the world.

**Conclusion I** Canadian steel manufacturers must be making a huge profit on their steel.

**Conclusion II** There is something about the manufacturing process employed by Canadian steel manufacturers that makes their steel harder.

- (A) Only Conclusion I follows.
- (B) Only Conclusion II follows.
- (C) Either Conclusion I or II follows.
- (D) Neither Conclusion I nor II follows.
- (E) Both Conclusions I and II follow.

13. In the given question, there are five choices (A-E). Four of them are alike and one is different. Mark the one that is different.

- (A) Typhoon
- (B) Volcano
- (C) Storm
- (D) Hurricane
- (E) Cyclone

14. **Statement:** All coolers are fans. Some fans are ACs. All ACs are irons. Some irons are blades.

**Conclusion I** Some fans are irons.

**Conclusion II** Some coolers are ACs.

**Conclusion III** Some blades are coolers.

**Conclusion IV** Some fans are blades.

- (A) Only I is correct
- (B) I and II are correct

- (C) I and III are correct  
 (D) II and IV are correct  
 (E) Only IV is correct

15. If P is the brother of Q, B is the brother of Q and P is the brother of E, then which of the following statements is definitely true?

- (A) Q is the brother of B  
 (B) Q is the brother of E  
 (C) E is the brother of B  
 (D) B is the brother of E  
 (E) None of these

Question 16 consists of a statement followed by two decisions. You have to assume everything in the statement to be true and, on the basis of the information given in the statement, decide which of the suggested courses of action logically follow(s). Select from the following choices:

- (A) Only I follows  
 (B) Only II follows  
 (C) Either I or II follows  
 (D) Neither I nor II follows  
 (E) Both I and II follow

16. **Statement:** Vitamin D is vital for the human body. A lot of people take Vitamin D tablets but these tablets are not as beneficial as taking in Vitamin D from natural sources.

**Decision I** The sale of Vitamin D tablets should be banned by the government.

**Decision II** People should be encouraged to consume food rich in Vitamin D such as fish, milk and so on.

17. In the given question, there are five choices (A-E). Four of them are alike and one is different. Mark the one that is different.

- (A) 34  
 (B) 102  
 (C) 68  
 (D) 51  
 (E) 47

18. Study the matrices and determine the digits that comprise the given word.

	0	1	2	3	4
0	R	A	E	B	N
1	S	C	R	M	E
2	D	V	T	R	V
3	T	P	F	Y	S
4	W	R	B	U	E

	5	6	7	8	9
5	T	G	L	R	W
6	A	Z	K	F	E
7	Y	L	I	G	I
8	P	S	P	T	L
9	L	X	G	C	P

### RELEGATE

- (A) 12, 02, 76, 68, 78, 65, 22, 44  
 (B) 23, 69, 89, 02, 56, 01, 98, 44  
 (C) 00, 69, 89, 02, 56, 01, 55, 44  
 (D) 41, 69, 57, 14, 97, 11, 22, 69  
 (E) 00, 69, 89, 02, 56, 01, 55, 79

**Directions for Questions 19-22:** Read the following information and answer the questions that follow.

"Four dogs F, G, H, J and two cats—K and M—will be assigned to exactly six cages numbered 1 to 6. Cage 1 faces Cage 4, Cage 2 faces Cage 5 and Cage 3 faces Cage 6.

The following conditions apply: The cats cannot face each other, else they'll start fighting. A dog must be put in Cage 1. H must be put in Cage 6. J must be put in a cage whose number is 1 more than the number of K's cage K and H cannot be opposite each other."

19. Which one of the following must be true?  
 (A) F is assigned to an even numbered cage.  
 (B) F is assigned to Cage 1.  
 (C) J is assigned to Cage 2 or Cage 3.  
 (D) J is assigned to Cage 3 or Cage 4.  
 (E) K is assigned to Cage 2 or Cage 4.
20. If J is assigned to Cage 3, which one of the following could be true?  
 (A) F is assigned to Cage 2.  
 (B) F is assigned to Cage 4.  
 (C) G is assigned to Cage 1.  
 (D) G is assigned to Cage 4.  
 (E) M is assigned to Cage 5.
21. Which one of the following must be true?  
 (A) A cat is assigned to Cage 2.  
 (B) A cat is assigned to Cage 5.  
 (C) K's cage is in a different row from M's cage.  
 (D) Each cat is assigned to an even-numbered cage.  
 (E) Each dog is assigned to a cage that faces a cat's cage.
22. If K's cage is in the same row as H's cage, which one of the following must be true?  
 (A) F's cage is in the same row as J's cage.  
 (B) F is assigned to a lower-numbered cage than G.  
 (C) G is assigned to a lower-numbered cage than M.  
 (D) G's cage faces H's cage.  
 (E) M's cage is in the same row as G's cage.

23. A statement is followed by two conclusions, numbered I and II. On the basis of the information given in the statement, decide which of the conclusions can be drawn logically from the given statement.

**Statement:** Should the Lokpal Bill be passed in the Parliament?

- Argument I** Yes. This is the only way to ensure a corruption-free country.
- Argument II** No. It is impossible to make a country as large as India completely corruption free.
- Argument III** Yes. It will help curb corruption by putting several checks and balances in place.
- Argument IV** No. The Lokpal is already present in several states in India, but it has not proved to be particularly effective in curtailing corruption in those states.

- (A) Only II is strong  
(B) Only III is strong  
(C) Only IV is strong  
(D) Only I and IV are strong  
(E) Only III and IV are strong

24. **Statement:** Should the number of holidays for government employees in India be reduced?

- Argument I** Yes. No government employee in any other country gets as many holidays as a government employee does in India.
- Argument II** Yes. This will help speed up work in government offices.
- Argument III** No. Government employees should be treated at par with employees in the private sector who get fewer holidays.

- Argument IV** No. The work done by government employees is extremely stressful, so they need extra holidays to unwind from this stress.

- (A) Only II and III are strong  
(B) Only III and IV are strong  
(C) Only II is strong  
(D) Only II, III and IV are strong  
(E) All are strong

25. Given alongside is a statement followed by three arguments numbered I, II and III. Decide which of the given arguments is strong and is able to support the given statement. **(Real NMAT Question)**

**Statement:** It is good that the Central Board is switching its exam pattern to an Open-Book exam pattern like the other Boards in the country.

- Argument I** Yes, an Open-Book exam will test the higher-order thinking skills rather than test learning through rote or memorising.

- Argument II** No, exams have to be treated as exams—accessing books during the exams has long been considered an unhealthy practice.

- Argument III** Yes, an Open-Book exam simulates the real world. In our day-to-day existence, we have access to everything—what is important is whether we know when to access what.

- (A) Only Argument I is strong.  
(B) Only Argument II is strong.  
(C) Both I and II are strong arguments.  
(D) Both I and III are strong arguments.  
(E) Neither I nor II nor III is a strong argument.

26. A statement is followed by two conclusions, numbered I and II. On the basis of the information given in the statement, decide which of the conclusions can be drawn logically from the given statement. **(Real NMAT Question)**

**Statement:** In the starry night that month, there were no scooters parked outside the mall.

**Conclusion I** People had gone to gaze at the stars.

**Conclusion II** Starry nights were rare.

- (A) Only Conclusion I follows.  
(B) Only Conclusion II follows.  
(C) Both Conclusions I and II follow.  
(D) Either Conclusion I or II follows.  
(E) Neither Conclusion I or II follows.

27. In a certain code language, if the word 'HOLMES' is coded as 'PINMTF', then how will 'CREATE' be coded? **(Real NMAT Question)**

- (A) SDBFFU  
(B) RCAEET  
(C) SDAEFU  
(D) RCBFFU  
(E) SDBGGU

28. Select a code for 'PROFIT', which follows the same code as 'COMMON'. **(Real NMAT Question)**

- (A) MOLDFQ  
(B) RUSKOA  
(C) RUSLOA  
(D) SUQTIF  
(E) RFIRFI

29. The code for the word RAMSHACKLE in a certain language is 23 - 6 - 18 - 24 - 13 - 6 - 8 - 16 - 17 - 10. What will be the code for the word ONEROUS in that language? (**Real NMAT Question**)

- (A) 22 - 5 - 6 - 9 - 10 - 20 - 25
- (B) 7 - 23 - 21 - 15 - 19 - 10 - 2
- (C) 15 - 14 - 5 - 18 - 15 - 21 - 19
- (D) 20 - 19 - 10 - 23 - 20 - 26 - 24
- (E) 26 - 12 - 16 - 16 - 10 - 14 - 18

Directions for Questions 30-33: Read the following information and answer the questions that follow.

Eight friends N, L, M, R, P, Y, T and Q are sitting around a circular desk facing away from the centre. Each friend has a different car—Lambretta, VW, Lycan, Creta, Ariel, Garmin, Punto and Scorpio, but not necessarily in that order. T is sitting third to the right of P. The one who owns Lambretta is second to the left of the one who owns Lycan. Y owns Lycan and is sitting exactly between P and L. The one who owns Punto is sitting second to the right of N. The one who owns Ariel is second to the right of the person who owns Garmin. P sits third to the left of the person who owns VW. Neither Q nor L is the immediate neighbour of N. Q is fourth to the left of L. N does not own Creta or Ariel. The person who owns Lambretta is sitting second to the right of the person who owns Creta. R owns Lambretta and he is not an immediate neighbour of N.

30. Who sits fourth to the right of L?
- (A) P
  - (B) Y
  - (C) R
  - (D) Q
  - (E) None of these
31. Which of the following cars does N own?
- (A) Punto
  - (B) Scorpio
  - (C) Garmin
  - (D) VW
  - (E) Lycan
32. What is P's position with respect to Q?
- (A) Third to the left
  - (B) Fifth to the left
  - (C) Second to the right
  - (D) Third to the right
  - (E) Fourth to the left

33. Which of the following combinations is correct?

- (A) R - Garmin
- (B) Y - Creta
- (C) N - Scorpio
- (D) T - Ariel
- (E) All are true

Questions 34-36 contain two statements that are followed by two conclusions. You need to decide which of the given conclusions logically follows from the statements, disregarding commonly known facts. Select your choices from the following options:

- (A) Only Conclusion I follows
- (B) Only Conclusion II follows
- (C) Either Conclusion I or II follows
- (D) Neither Conclusion I nor II follows
- (E) Both Conclusions I and II follow

34. **Statements:** All chairs are pins. Some pins are sofas.

**Conclusion I** Some sofas are chairs.

**Conclusion II** Some sofas are not pins.

35. **Statements:** All stones are chisels. No chisel is a pen.

**Conclusion I** Some stones are pens.

**Conclusion II** No pen is a stone.

36. **Statements:** Some trees are green. All green are not blue.

**Conclusion I** Some trees are not green.

**Conclusion II** Some trees are not blue.

Questions 37-43 consist of a statement followed by two assumptions. Consider the statement and the two assumptions and decide which of the assumptions is implicit in the statement. Select from the following options:

- (A) Only I is an assumption
- (B) Only II is an assumption
- (C) Either I or II is an assumption
- (D) Neither I nor II is an assumption
- (E) Both I and II are assumptions

- 37. Statement:** Of late, incidents of food poisoning caused by the consumption of grains mixed with impurities have been taking place in rural areas.

**Assumption I** There are many shops selling grains mixed with impurities in rural areas.

**Assumption II** The percentage of people consuming grains is higher in rural areas.

- 38. Statement:** The bank's recent investment in an e-commerce start-up is a total gamble.

**Assumption I** The bank may lose its investment.

**Assumption I** It is not sufficiently clear whether the venture will succeed.

- 39. Statement:** The government has decided to levy a 2% education cess to fund education programmes across India.

**Assumption I** The government currently does not have sufficient money to fund these education programs.

**Assumption II** The people of India want to contribute towards setting up these education programs.

- 40. Statement:** Children less than five years of age need to be continually kept mentally stimulated.

**Assumption I** A large part of the development of intelligence and other social skills takes place in the early years of a child.

**Assumption II** 40 percent of a person's intelligence at the age of 22 can be predicted by the age of five.

- 41. Statement:** Rahul has spent several hours every day preparing for the upcoming national entrance test, but he is still not sure how he will perform in it.

**Assumption I** Rahul may perform well in the test.

**Assumption II** The test is a very difficult one.

- 42. Statement:** The manager of the hotel instructed his staff to provide dinner to all the guests.

**Assumption I** Had the manager not instructed, dinner may not have been served to all the guests at the hotel.

**Assumption II** The guests will be in the hotel at dinner time.

- 43. Statement:** Sign posted on a lift—Please do not use lift in case of fire.

**Assumption I** In case of fire, the lift will stop functioning.

**Assumption II** In case of fire, there is a high probability that the lift will fall down.

**Assumption III** People may be endangering their lives if they use the lift, in case of a fire.

- (A) Only I is implicit
- (B) Only III is implicit
- (C) Only I and II are implicit
- (D) All are implicit
- (E) None are implicit

- 44. Rajeev is the brother of Rishi. Karuna is the sister of Ajay. Rishi is the son of Karuna. How is Rajeev related to Ajay?**

- (A) Son
- (B) Brother
- (C) Nephew
- (D) Father
- (E) Uncle

- 45. Ajay and Binod are brothers and Chaitali and Dhvani are sisters. Ajay's son is Dhvani's brother. How is Binod related to Chaitali?**

- (A) Grandfather
- (B) Brother
- (C) Son
- (D) Uncle
- (E) Father

- 46. Statement:** You will never know how big a bookstore can be unless you enter the Delhi Book Store.  
**(Real NMAT Question)**

**Assumption I** The Delhi Book Store has the greatest number of books.

**Assumption II** You cannot imagine a book store as big as the Delhi Book Store.

- (A) Only I is an assumption
- (B) Only II is an assumption
- (C) Both I and II are assumptions
- (D) Either I or II is an assumption
- (E) Neither I nor II is an assumption

47. Pointing to Akshay, Rahul said, 'I am the only son of one of the sons of his father.' How is Akshay related to Rahul?

(A) Nephew  
(B) Uncle  
(C) Father or Uncle  
(D) Father  
(E) Brother or Nephew

48. In a certain code, DONKEY is written as XDJMNC. How is LION written in that code?

(A) MNHK  
(B) BHUP  
(C) VGSW  
(D) LDRE  
(E) MUO

49. For the past two decades, Eton Coaching Institute has been the market leader in preparing students for the entrance test to medical schools in the country. While several new players have set up shop in the last few years, and have shown good results, it remains without doubt that if a student wishes to pass the medical school entrance test, his best chances are with Eton Coaching Institute.

The statements above, if true, best support which of the following assertions?

- (A) There is something unique about the books provided by the Eton Coaching Institute that makes its students perform very well in the medical school entrance test.  
(B) If a student does not join the Eton Coaching Institute, he will most likely fail the medical school entrance test.  
(C) The teachers at Eton Coaching Institute are probably better than those at other institutes.  
(D) A student could clear the medical school entrance test, even if he hasn't studied at the Eton Coaching Institute.  
(E) If a student has studied at the Eton Coaching Institute, he will clear the medical school entrance test.

50. In a code language, 'The day looks sunny' is written as 'dim may zook manny'

'Thursday was a sunny day' is written as 'bekbay il po manny may'

'Sunny days are here again' is written as 'manny kil lop pere jukol'

What is the code for 'sunny'?

(A) zook  
(B) may

(C) dim  
(D) manny  
(E) bekbay

Questions 51–53 consist of a statement followed by two/three assumptions. Consider the statement and the assumptions and decide which of the assumptions is implicit in the statement.

51. **Statement:** The government has issued a diktat to all farmers to cut down on their use of pesticides as it may end up polluting the ground water.

**Assumption I** At least, some farmers currently use more pesticide than is needed.

**Assumption II** Farmers will be able to cut down on the use of pesticides without it making any significant difference to their production.

**Assumption III** Pollution of ground water may lead to adverse effects.

- (A) Only I is implicit  
(B) Only III is implicit  
(C) Only II and III are implicit  
(D) Only I and III are implicit  
(E) All are implicit

52. **Statement:** The Apogee Laptop Company has decided to increase the price of its laptops by 25 percent with immediate effect.

**Assumption I** Other laptop manufacturers will also soon raise the prices of their respective laptops since Apogee is the market leader.

**Assumption II** The Apogee Company does not expect the demand for its laptops to go down considerably after this hike.

- (A) Only I is implicit  
(B) Only II is implicit  
(C) Either I or II is implicit  
(D) Neither I nor II is implicit  
(E) Both I and II are implicit

53. **Statement:** A newspaper has claimed in its new advertisement that it has dedicated half its pages to the sports section.

**Assumption I** Most of the newspaper's readers are current or past sportspeople.

**Assumption II** People who form the target market of this newspaper are very interested in sports-related news items.

**Assumption III** Other newspapers most likely have a smaller proportion of their pages dedicated to the sports section.

- (A) Only I is implicit  
(B) Only II is implicit  
(C) Only I and III are implicit  
(D) Only II and III are implicit  
(E) None are implicit
54. In a certain code, TRIFLE is written as FERTIL. How is JASPER written in that code?  
(A) ASEJRP  
(B) APJRES  
(C) PRAJSE  
(D) SEJPAR  
(E) PERSAJ
55. Forty six boys are standing in a row facing north. Raj is 14<sup>th</sup> from the left and Vikram is 29<sup>th</sup> from the right end of the row. How far away will Uday be from Vikram if he is standing eight places to the right of Raj? (*Real NMAT Question*)  
(A) One place  
(B) Two places  
(C) Three places  
(D) Four places  
(E) Five places
56. Kiran ranks 18<sup>th</sup> from the top and 23<sup>rd</sup> from the bottom in an examination. How many students are there in the class? (*Real NMAT Question*)  
(A) 38  
(B) 39  
(C) 40  
(D) 41  
(E) 42
57. In a certain code language, if RAHUL is coded as SBIVM, how is ANMOL coded in that same language? (*Real NMAT Question*)  
(A) BONRM  
(B) BONPM  
(C) BONQM  
(D) BONSM  
(E) BORNM
58. Each of the vowels in the word 'COMPLEX' is replaced by the number '3' and each consonant is replaced by a number which is the position of that consonant in the word, that is, C by 1, M by 3 and so on. What is the total of all the numbers once the replacement is complete? (*Real NMAT Question*)  
(A) 22  
(B) 23  
(C) 24  
(D) 25  
(E) None of the above
59. What should be the next term in the series 22, 31, 40, 49, 58, \_\_\_\_\_?  
(A) 67  
(B) 68  
(C) 71  
(D) 73  
(E) 77
60. What number should come next in the following series?  
5, 7, 12, 19, 31, 50,  
(A) 63  
(B) 76  
(C) 81  
(D) 86  
(E) 91
- Directions for Questions 61–64:** A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule in each step. The following is an illustration of input and rearrangement.
- Input: gas net 54 36 17 fan act 65  
Step 1: 65 gas net 54 36 17 fan act  
Step 2: 65 act gas net 54 36 17 fan  
Step 3: 65 act 54 gas net 36 17 fan  
Step 4: 65 act 54 fan gas net 36 17  
Step 5: 65 act 54 fan 36 gas net 17  
Step 6: 65 act 54 fan 36 gas net 17  
Step 7: 65 act 54 fan 36 gas 17 net
61. What will be step 3 for the following input?  
can axe 32 12 kit 57 bat 89  
(A) 89 axe 57 bat 32 can 12 kit  
(B) 89 axe 57 bat can 32 12 kit  
(C) 89 axe can 32 12 kit 57 bat  
(D) 89 axe 57 can 32 12 kit bat  
(E) 89 can axe 32 12 kit 57 bat
62. How many steps will be needed to complete the following arrangement?  
76 cot 64 dog 45 hen 54 urn

- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5

63. If step 3 of an input is as given below, which of the following must have definitely been the input?

76 gap 56 ink 14 leg 22 oxe

- (A) oxe 56 ink 56 leg 22 gap 76  
(B) 56 ink 56 leg 22 gap 76 oxe  
(C) 56 76 ink oxe 56 leg 22 gap  
(D) 22 gap 76 oxe 56 ink 56 leg  
(E) Cannot be determined

64. What will be last step for the following input?

tie 56 mat 99 pot 33 jut 22

- (A) jut 99 mat 56 pot 33 tie 22  
(B) 99 jut 56 pot 33 mat 22 tie  
(C) 99 tie 56 pot 33 mat 22 jut  
(D) 99 jut 56 mat 33 pot 22 tie  
(E) 22 jut 33 mat 56 pot 99 tie

65. One evening Suresh and Ramesh were talking to each other and Suresh's shadow fell behind Ramesh. Which direction was Ramesh facing?

- (A) East  
(B) West  
(C) North-west  
(D) South  
(E) North

Questions 66–69 consist of a statement followed by two conclusions. Assume everything in the given statement to be true, and then decide which of the two conclusions logically follow from this statement. Select your answer from the following choices:

- (A) Only Conclusion I follows  
(B) Only Conclusion II follows  
(C) Either I or II follows  
(D) Neither I nor II follows  
(E) Both I and II follow

66. **Statement:** In a football match, three of the goals scored by the winning team were scored by defenders and not by strikers.

**Conclusion I** The winning team has better defenders than it has strikers.

**Conclusion II** Had the winning team's defenders not scored those goals, the team would have lost the match.

67. **Statement:** The government of the Maldives has recently announced various discounted package tours for tourists visiting Maldives.

**Conclusion I** The government of the Maldives wants more foreign tourists to visit the Maldives.

**Conclusion II** There has been a decline in the number of tourists visiting the Maldives in recent years.

68. **Statement:** Money plays a vital role in business.

**Conclusion I** Poor people can never become successful businessmen.

**Conclusion II** All rich people own businesses.

69. **Statement:** It is the dream of every Indian student to study at Harvard University, which has only 900 seats.

**Conclusion I** Some of the students will not be able to achieve their dream of studying at Harvard University.

**Conclusion II** Harvard University is the highest ranked university in the world.

70. A popular talk show host has been regularly making fun of a new movie on his programme for the past few days. The director of the movie attributes the poor performance of the movie to this fact.

Which of the following options most seriously weakens the above argument?

- (A) Several other film makers have also accused the talk show host of talking poorly about their movies.  
(B) There has been no change in the ticket prices at movie theatres in the past few months.  
(C) The talk show host has also made fun of several other movies and TV programmes on his talk show during this period.  
(D) The talk show host makes fun of only those movies that perform poorly at the box office.  
(E) The movie has been criticised by some sections of the media too for being overly long and having a clichéd storyline.

71. If it is possible to make only one meaningful word with the second, fourth, sixth and ninth letters of the word 'GOVERNMENT' using each only once, which of the following will be the third letter of that word? If no such word can be formed, give 'X' as the answer and if more than one such word can be formed, give 'Y' as the answer. (Real NMAT Question)



- (A) O
- (B) E
- (C) X
- (D) N
- (E) Y

72. In a recently conducted survey on the quality of life among the citizens of a city, surveyors spoke to 980 citizens, a majority of whom said that they were satisfied with their quality of life. Thus, it can be concluded that the citizens of this city are satisfied with their quality of life.

Which of the following options most seriously weakens the above argument?

- (A) The surveyors spoke to people from only a particular economic strata.
- (B) Some of the respondents said that they were extremely dissatisfied with their quality of life.
- (C) The survey results are different from what have been reported from other neighbouring cities.
- (D) The survey sample was representative of the entire population of the city.
- (E) The governing body of the city is not very different from the governing bodies of other neighbouring cities.

73. **Statement:** Most of the items available at malls are expensive.

**Conclusion I** Some items available at malls may not be expensive.

**Conclusion II** There are no cheap items available at malls.

**Conclusion III** The quality of products available at malls is better.

**Conclusion IV** The stores at malls cheat customers.

- (A) Only I can be inferred
- (B) Only III can be inferred
- (C) Only I and III can be inferred
- (D) Only II, III and IV can be inferred
- (E) All can be inferred

74. Scientists have discovered that manganese containing Element Z is stronger and more flexible than ordinary manganese because Element Z reduces the problem of small breakages. The level of Element Z in much of the manganese produced in Australia is naturally high because of the natural topography of the region.

Which of the following can be correctly inferred from the statements above?

- (A) Manganese produced from Australian ore deposits contains the highest levels of Element Z found in any manganese.
- (B) Manganese from Australia is stronger and more flexible than manganese from any other country.
- (C) Manganese that is not from Australia is very likely to encounter the problem of small breakages.
- (D) Producing manganese from ore deposits containing Element Z is the best way to make manganese that is strong.
- (E) Some manganese produced in Australia is less likely to develop small breakages than other manganese.

75. **Statement:** A few businessmen and all the politicians involved in the 2G scam were arrested last week. Ajay and Virendra were among those arrested.

**Conclusion I** Ajay and Virendra are politicians.

**Conclusion II** Ajay and Virendra are businessmen.

**Conclusion III** Ajay and Virendra are involved in the 2G scam.

**Conclusion IV** Ajay and Virendra are either politicians or businessmen.

- (A) Only I can be inferred
- (B) Only III can be inferred
- (C) Only IV can be inferred
- (D) Only I and III can be inferred
- (E) Only III and IV can be inferred

76. 65% of all circus units in Country X have lions, 70% have tigers, 55% have elephants and 40% have bears. At least what percentage of circus units in Country X have all four animals in their team if it is also known that the percentage of only lions and tigers (both) in the units is 15; the percentage of only lions and bears (both) in the units is also 15; the percentage of only tigers and elephants (both) in the units is 10; that of only lions, tigers and elephants (all three) in the units is 5 and the percentage of tigers, elephants and bears is 10? Assume that there are no other combination of animals in the circus units.  
**(Real NMAT Question)**

- (A) 5
- (B) 10
- (C) 15
- (D) 25
- (E) 35

77. An international mining company came up with an idea to extract precious metals in space from the asteroids and meteoroids approaching close to Earth. A metallurgical engineer appealed to the international space regulatory agency against allowing this company to extract from any alien body. **(Real NMAT Question)**

Which of the statements, if true, would most severely strengthen the appeal of the metallurgical engineer?

- (A) Space mining is very expensive and the money should be used for the betterment of the poor people on Earth.
- (B) Many areas on Earth have not yet been explored for mining which might have huge deposits of precious metals.
- (C) No significant material has been reported from any asteroid or meteoroid study, so it could be a worthless project.
- (D) Scientists should look for opportunities to explore new and alternative options to benefit human life within planet Earth.
- (E) The asteroids and meteoroids are known to contain hazardous materials, which if brought to Earth could cause serious ecological problems.

78. Suppose that the symbols @, # and \$ were defined in reference to a set to imply the following: **(Real NMAT Question)**

@ (P, Q) = H.C.F. of P and Q

# (P, Q) = L.C.M. of P and Q

\$ (P, Q) =  $P \times Q$

What would you conclude from \$[@ (12, 18), # (12, 18)]?

- (A) \$ (6, 36)
- (B) # (12, 18)
- (C) \$ (12, 18)
- (D) @ (36, 6)
- (E) None of the above

79. There are two ways of successfully completing a marathon—practise running for 4 hours every day or make changes to your diet so that you are consuming more high energy foods. Research has clearly proved that practising running is far more effective than making changes to your diet, as far as competing in a marathon is concerned. Thus, if a person consistently runs for at least 4 hours every day, he is doing the most that can be done to perform well in the marathon.

Which of the following options, if true, most seriously weakens the above argument?

- (A) Some experienced marathon runners believe that diet plays a more important role in their performance than exercise or running.
- (B) The performance in the marathon can be improved further by employing both the strategies together.
- (C) Everyone who competes in a marathon does not necessarily do so for the purpose of winning it, but for its health benefits.
- (D) One of the most important aspects of performing well in a marathon is the ability to manage your pace.
- (E) A marathon is as much a test of endurance as it is of speed.

80. Given alongside is a statement followed by two assumptions numbered I and II. An assumption is something supposed or taken for granted. You have to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement. **(Real NMAT Question)**

**Statement:** Each and every citizen should be completely dedicated to his/her motherland; otherwise, his/her citizenship should be rejected.

**Assumption I** It is possible to know whether a citizen is dedicated to his motherland or not.

**Assumption II** If one's citizenship is rejected, it should not be seen as punishment.

- (A) Only Assumption I is implicit.
- (B) Only Assumption II is implicit.
- (C) Either Assumption I or II is implicit.
- (D) Neither Assumption I nor II is implicit.
- (E) Both Assumptions I and II are implicit.

**Questions 81–82** consist of a statement followed by two assumptions. You have to consider the statement and the two assumptions and decide which of the assumptions is implicit in the statement. Select from the following options:

- (A) Only I is implicit
- (B) Only II is implicit
- (C) Either I or II is implicit
- (D) Neither I nor II is implicit
- (E) Both I and II are implicit

81. **Statement:** Suresh has applied for a loan of Rs. 60000 from his bank to pay for his son's educational expenses.

**Assumption I** The bank will reject the loan because it has a policy of not awarding loans for education purpose.

**Assumption II** Suresh has failed to arrange for the money from all other sources available to him.

82. **Statement:** Until the release of this book, such a lucidly written book was not available on this subject.

**Assumption I** There are other books available on this subject.

**Assumption II** For a book to sell well, it is very important that it be lucidly written.

83. Fill in the blank in the series:  
(Real NMAT Question)

132, 182, 306, \_\_, 552

- (A) 362
- (B) 380
- (C) 428
- (D) 452
- (E) 474

84. A company sells two types of mobile phones – A and B. The total sales of these two phones increased by 24% between 2010 and 2015. In the same period, however, the sales of 'B' type mobile phones, most of which were sold from the company's exclusive outlets, grew by just 6%.

Which of the following conclusions about the company's sales from 2010-15 is best supported by the statements above?

- (A) Buyers were more likely to buy type 'A' mobile phones when they went to multi brand phone sellers.
- (B) The prices of mobile phones purchased at the company's exclusive stores were higher than those phones that were purchased elsewhere.
- (C) The sales of type 'A' mobile phones increased by more than 24% during this period.
- (D) A majority of Type 'B' mobile phones were purchased by corporate buyers who tend to make bulk purchases.
- (E) The number of people who bought mobile phones from multi brand sellers increased during this period.

85. Economists have discovered that, at comparable income levels, people living in rural areas generally have more purchasing power than people living in cities. This is because some of the income that city dwellers use for food and housing can be used by rural dwellers for other needs.

Which of the following assertions is implied the most in the above statements?

- (A) People in both rural and urban areas tend to spend a large proportion of their income on food and housing.
- (B) The actual income of city dwellers is more as compared to rural dwellers.
- (C) People living in rural areas have lower food and housing costs than people living in cities.
- (D) While city dwellers earn more, they also spend more because of higher food and housing costs.
- (E) City dwellers save a larger proportion of their income than rural dwellers.

86. According to a report by the American Staffing Federation (ASF), the government's new policy for the retail industry is likely to create 2 million jobs for fresh graduates over the next three years. The ASF has, thus, welcomed the government's move to implement this policy across the nation as its implementation will lead to a lower national unemployment rate.

Which of the following, if true, would cast the most serious doubt on the accuracy of ASF's conclusion?

- (A) Opponents of the policy will not allow the government to implement the policy any time soon.
- (B) The new policy will result in a large number of uneducated workers becoming redundant and, as a result, losing their jobs.
- (C) There are several other ways of lowering the national unemployment rate available to the government.
- (D) The nation faces more serious problems than unemployment and the government should instead focus on resolving those first.
- (E) The implementation of the new policy is going to cost the government a considerable amount of money so the government will most likely increase corporate tax rates to recover this amount.

87. It may soon be possible to insure your Facebook, Twitter and other social media accounts against the nuisance of hacking as a company has launched the country's first social media insurance. The insurance includes the cost of disabling accounts, suppressing offensive material and stopping any legal action triggered by hacking; for example, if a hacker posts illegal material under a victim's name.

Which of the following can properly be inferred from the statements above?

- (A) Social media insurance will make it possible for individuals to sue hackers who post offensive content in their name.

- (B) The launch of social media insurance will, most likely, lead to a fall in the incidence of hacking on social media sites such as Facebook and Twitter.
- (C) There is a cost associated with enabling and disabling a social media account.
- (D) Under current laws it is possible for a person to be sued for posting offensive material online even if the person did not post the material himself.
- (E) Social media insurance will only be available for Facebook and Twitter users.

Question 88 consists of a statement followed by two or more conclusions. Assume everything in the given statement to be true, and then decide which of the conclusions logically follow from this statement. Select your answer from the given choices.

88. **Statements:** All cricketers are sportsmen. Some cricketers are married. Some sportsmen are rich. All footballers are sportsmen.

**Conclusion I** Some rich sportsmen are cricketers.

**Conclusion II** Some married people are cricketers.

**Conclusion III** Some sportsmen are footballers.

**Conclusion IV** Some cricketers are footballers.

- (A) Only conclusion II follows
- (B) Conclusion I and II follow
- (C) Both II and III follow
- (D) Both II and IV follow
- (E) Only conclusion III follows

**Directions for Questions 89–90:** In each question below is given a statement followed by two conclusions numbered I and II. You have to assume everything in the statement to be true. Then consider the two conclusions together and decide which of them logically follows beyond a reasonable doubt from the information given in the statement.

- (A) Only conclusion I follows
- (B) Only conclusion II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

89. **Statement:** A situation is never good or bad. It is our perception of it that makes it appear good or bad to us.

**Conclusion I** Some people may find a situation good, whereas some others may find the same situation bad.

**Conclusion II** In order to be happy, one must learn to manage his perceptions.

90. **Statement:** Tendulkar was blessed with natural ability, no doubt, but even he had to practice for hours to excel in his field.

**Conclusion I** Natural ability by itself may not guarantee excellence.

**Conclusion II** Had Tendulkar not practiced for hours, he would not have excelled in his field.

91. Kavita is going to appear for an aptitude test in two months. To successfully clear this test, a person needs to do two things—take 20 practice tests and also attend 15 coaching sessions by a popular teacher. Nobody who has failed to meet the previous two criteria has ever cleared this test. If Kavita takes the 15 coaching sessions, she will only have enough time to attempt 15 practice tests and if she attempts 20 practice tests, she will only have enough time to take 10 coaching sessions.

The claims above, if true, most strongly support which of the following conclusions?

- (A) Kavita should take all 15 coaching sessions and then take as many tests as she can since tutoring is more important than practising.
- (B) As long as Kavita takes the 20 practice tests, she will most likely be able to clear the aptitude test.
- (C) Kavita will retake the aptitude test if she is not able to successfully clear it the first time.
- (D) Kavita will most likely not be able to clear the aptitude test.
- (E) If Kavita attends the 15 coaching sessions, she will most likely be able to clear the aptitude test.

92. Conservation of tigers is a major concern for wildlife experts across the world since the number of tigers left in the wild is rapidly declining. While several countries are taking steps to counter this fall, experts are unanimously of the opinion that if the tiger is to survive in the wild, its best chances of doing so are in India.

The claims above, if true, most strongly support which of the following conclusions?

- (A) The survival of the tiger is under threat in countries other than India also.
- (B) If the tiger fails to survive in India, it will become extinct.
- (C) The Indian government is not taking enough steps to check the poaching of tigers.

- (D) The maximum number of tigers in the world are found in India.
- (E) The number of tigers outside India is falling at a faster rate than within India.

93. The list of the highest paying cities in the world is headed by cities in Switzerland. This serves to reaffirm the fact that people in Western European cities on average earn three times more than those in Eastern Europe. The fact that, in Switzerland, deductions from salaries are relatively low, further widens the gap between net wage level earned there and in other countries, especially in the rest of Western Europe. The largest wage differences are in Asia, where the highest value (Tokyo) is twelve times higher than the lowest (Delhi).

Which of the following can be inferred from the statement above?

- (A) The Swiss pay less money in taxes than people in the rest of Western Europe.
- (B) Delhi is the poorest city in the Asian continent.
- (C) The wage difference between the richest and poorest cities of Eastern Europe is less than twelve times.
- (D) Switzerland is not situated in Western Europe.
- (E) Tokyo has more rich people than Delhi.

94. The main purpose of business is to maximise shareholder value over the long-term by selling goods or services. Thus, employees who use funds for anything other than to increase their sales are simply cheating the shareholders.

Which of the following is an assumption made in drawing the conclusion above?

- (A) Most business owners would agree with the above definition of the purpose of a business.
- (B) Increasing sales is not the only way to maximise shareholder value.
- (C) Spending money on making the workplace more comfortable for employees will not lead to increased worker productivity and in turn increased business profits.
- (D) The only function of a business is to maximise returns for its shareholders.
- (E) According to this definition, many employees could be accused of cheating.

**Questions 95–97** consist of a statement followed by two decisions. You have to assume everything in the statement to be true and, on the basis of the information given in the statement, decide which of the suggested courses of action logically follow(s). Select from the following choices:

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

95. **Statement:** The Korean garment export industry venturing into the Latin American markets faces tough competition from the Chinese.

**Courses of Action: I** Garment manufacturers from Korea should drop the plans of entering Latin America.

**Courses of Action: II** Garment manufacturers from Korea should improve the quality of their products so that they are able to compete better with the Chinese.

96. **Statement:** The influx of apples imported from California in Indian stores has considerably reduced the demand for indigenous apples, which tend to be of an inferior quality.

**Courses of Action: I** The government should force Indian stores to stop selling the imported apples and incentivise them to sell Indian apples.

**Courses of Action: II** To help indigenous apple growers, the government should impose high import duties on imported apples.

97. **Statement:** The state owned airline has been continuously making losses for the past several years with no signs of profits anytime soon.

**Courses of Action: I** The government should provide a bailout package to the airline in order to ensure that it does not collapse.

**Courses of Action: II** The government should take steps to ensure that the airline improves its productivity and reduces wasteful expenditure.

98. A jewellery manufacturer produces rings in two metals—gold and platinum. The manufacturer has noted that, over the last three years, the gold rings have consistently outsold the platinum ones by a large margin, even though the designs available in both the metals are exactly the same. This has led the manufacturer to conclude that consumers prefer gold to platinum.

Which of the following, if true, most seriously weakens the argument?

- (A) Over the last three years, diamond rings have outsold both gold and platinum ones.
- (B) Jewellery buyers give more importance to design than to the metal used.
- (C) Platinum is easier to maintain than gold.
- (D) Platinum rings take longer to produce than gold rings.
- (E) Gold rings cost considerably less than platinum ones.

99. In the equation below, every letter represents a unique digit. If the value of E is greater than the value of R and the value of D is smaller than the value of I, then which of the following statements is true? **(Real NMAT Question)**

	T	R	U	E
+	I	D	E	A
	E	9	I	I

- (A) Letter 'A' will definitely have the highest value among all letters.
  - (B) Letter 'I' will definitely have the lowest value among all letters.
  - (C) The difference between the values of 'A' and 'R' will definitely be 2.
  - (D) Letter 'E' and letter 'I' will definitely represent consecutive numbers.
  - (E) Letter 'U' and letter 'A' will definitely represent consecutive numbers.
100. As Peter Parker's Uncle Ben says to him: 'With great power comes great responsibility.' **(Real NMAT Question)**
- The argument above assumes that:
- (A) Uncle Ben is always right.
  - (B) At least some people follow Uncle Ben.
  - (C) Peter Parker has got some great powers.
  - (D) Peter Parker listens to what his uncle says.
  - (E) Uncle Ben sometimes lends his words of wisdom to Peter Parker.
101. Given below are two rows of data. In the first row is a number series. In the second row, is a number followed by (A), (B), (C), (D). **(Real NMAT Question)**
- If both the series follow the same logic, then what will come in place of (D) in the second row?

4	9	29	119	599
8	(A)	(B)	(C)	(D)

- (A) 205
  - (B) 413
  - (C) 876
  - (D) 1079
  - (E) 1814
102. The Chief Medical Officer of a district conducted a survey of 1,000 people; he found that 70% of the people who ate a particular variety of meat were resistant to antibiotic 'X', while 90% of the remaining people were not resistant to that antibiotic. He conducted further research to identify the reason behind it. It was identified that small doses of 'X' antibiotic was given to the animals whose meat 70% of the people had eaten. **(Real NMAT Question)**

Which of the following can be concluded from the passage above?

- (A) Meat is a good source of antibiotic 'X'.
- (B) Eating meat is an unhealthy habit, leading to several diseases.
- (C) Meat consumption makes the human body prone to certain diseases.
- (D) Small doses of antibiotic taken regularly make people immune to the antibiotic.
- (E) The animal body reacts in the same way as the human body towards antibiotic 'X'.

**Directions for Questions 103–106:** Read the following information and answer the questions that follow.

Sarah, Caitlin, Megan, Amy, Jessica, Emma, Amber and Zoe are sitting around a circular table facing the centre. Each one of them has a favourite fruit or vegetable—dandelion, eggplant, apple, tomato, cherry, spinach, broccoli and beetroot. Sarah sits third to the right of the person who likes tomato. Amy sits second to the left of Amber.

Amber is not an immediate neighbour of the person who likes tomato. Only one person sits between Caitlin who likes spinach and the person who likes tomato.

The person who likes apple sits third to the right of the person who likes spinach. Zoe sits between the person who likes apple and the person who likes eggplant. Jessica is not an immediate neighbour of Zoe.

The person who likes eggplant sits third to the right of the person who likes cherry. Only one person sits between the person who likes broccoli and Emma. Jessica likes neither broccoli nor dandelion.

**103.** Who sits third to the right of Megan?

- (A) Amber
- (B) Emma
- (C) The person who likes dandelion
- (D) Zoe
- (E) The person who likes beetroot

**104.** Which of the following statements must be true?

- (A) Zoe likes dandelion.
- (B) The person who likes cherry sits to the immediate left of Sarah.
- (C) Amy sits two places to the right of Amber.
- (D) Caitlin sits two places to the left of the person who likes tomato.
- (E) Jessica likes broccoli.

**105.** What is the position of the person who likes broccoli with respect to Zoe?

- (A) 3<sup>rd</sup> to the left
- (B) 4<sup>th</sup> to the right
- (C) 5<sup>th</sup> to the left
- (D) 4<sup>th</sup> to the left
- (E) 2<sup>nd</sup> to the right

**106.** Which of the following combinations is not correct?

- (A) Amber - cherry
- (B) Emma - apple
- (C) Amy - dandelion
- (D) Zoe - beetroot
- (E) Caitlin - spinach

**Questions 107–112** consist of a statement followed by two decisions. Assume everything in the statement to be true and, on the basis of the information given, decide which of the suggested courses of action logically follow(s). Select your answer from the following choices:

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

**107. Statement:** There has been a significant drop in the level of water in the main reservoir that supplies water to the city.

**Decision I** The city administration should appeal to all residents to cut down on their consumption of water.

**Decision II** The city administration should cancel the license of all water parks operating in the city.

**108. Statement:** Because of the availability of China-made firecrackers, the sales of firecrackers made in India have fallen drastically.

**Decision I** The import of firecrackers from China should be banned.

**Decision II** The Indian firecracker companies should give huge discounts on their products to match the prices offered by the Chinese vendors.

**109. Statement:** The female to male ratio in the state has become alarmingly low.

**Decision I** All families with a girl child should be offered incentives such as free housing and other monetary allowances.

**Decision II** Residents of the state should be educated about the importance of having a girl child.

**110. Statement:** There have been several incidences lately of doctors recommending medicines manufactured by those companies that offer huge commissions to these doctors.

**Decision I** There should be a complete ban on the payment of commission by medicine companies to doctors.

**Decision II** The doctors who are found guilty of such acts should be severely punished to discourage other doctors from following their footsteps.

**111. Statement:** There is a huge amount of garbage dumped on the northern side of Mount Everest from where thousands of climbers attempt to climb the summit every year.

**Decision I** The climbers should be encouraged to climb from the southern side of the mountain instead.

**Decision II** There should be a complete ban on any climbing activity on Mount Everest.

**112. Statement:** Several incidents of ragging have been reported from medical colleges in the state.

**Decision I** The government should ignore these incidents as ragging helps build a bond between senior and junior students.

**Decision II** The government should ensure that colleges take strict action against those found guilty of ragging.

**Directions for Questions 113–116:** Read the below information and answer the questions that follow.

Six people: C, D, E, F, G and H are standing in a straight line facing North, not necessarily in the same order. F is standing second to the left of D. C is standing fourth to the left of H and H is not standing on the extreme end of the line. D is standing second to the left of E.

113. What is the position of F with respect to E?
- (A) Immediate left
  - (B) Fourth to the left
  - (C) Third to the left
  - (D) Third to the right
  - (E) None of these
114. Which of the following pairs represents the people standing at the extreme ends of the line?
- (A) CE
  - (B) FH
  - (C) FE
  - (D) CH
  - (E) None of these
115. Who is standing second to the right of F?
- (A) H
  - (B) D
  - (C) G
  - (D) E
  - (E) None of these
116. Four of the following five pairs are alike in a certain way based on their position in the above arrangement and so form a group. Which of the following pairs do not belong to the group?
- (A) GC
  - (B) GE
  - (C) HG
  - (D) DE
  - (E) FD

**Directions for Questions 117–123:** In each of the following questions two statements are given and these statements are followed by two conclusions numbered I and II. You have to take the given two statements to be true even if they seem to be at variance from commonly known facts. Read the conclusions and then decide which of the given conclusions logically follows from the two given statements, disregarding commonly known facts. Select from the following options:

- (C) Either Conclusion I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

117. **Statements:** All cars are automobiles. All automobiles are trucks.

**Conclusion I** All trucks are cars.

**Conclusion II** All cars are trucks.

118. **Statements:** Some magazines are books. All novels are books.

**Conclusion I** Some books are novels.

**Conclusion II** Some books are magazines.

119. **Statements:** Some goods are broken. Some broken are free.

**Conclusion I** Some goods are free.

**Conclusion II** All free is broken.

120. **Statements:** All sweaters are hoodies. No hoodie is a jacket.

**Conclusion I** No sweater is a jacket.

**Conclusion II** All hoodies are sweaters.

121. **Statements:** All refrigerators are microwaves. Some televisions are refrigerators.

**Conclusion I** Some microwaves are televisions.

**Conclusion II** Some microwaves are refrigerators.

122. **Statements:** No sugar is salt. All salt is spice.

**Conclusion I** No sugar is spice.

**Conclusion II** Some spice is not sugar.

123. Over the past 2 years, there has been a sharp decline in the number of smokers in college campuses across the city. Over this same period, the city's governing council has spent a lot of money in coming up with advertisements highlighting the harmful effects of smoking targeted at college students. The authorities conclude that its advertisements have been responsible for the drop in cigarette use at college campuses within the city.

Which of the following options most seriously weakens the above argument?

- (A) There has been no similar decrease in the consumption of alcohol among college students.
- (B) There has been no appreciable decrease in the number of smokers within the city who are not in college.



- (C) The supply of cigarettes has remained unchanged within the city.
- (D) A change in the taxation structure has led to a rapid increase in cigarette prices over the last two years within the city.
- (E) Some studies show that there is no direct relation between smoking and the susceptibility to diseases such as lung cancer.

**124.** The sale of badminton racquets in Chennai has tripled in the last year. Thus, it can be concluded that more and more people in Chennai have started playing badminton.

Which of the following options most strengthens the above argument?

- (A) Chennai is famous for its badminton racquets and tourists often buy these racquets when they visit Chennai.
- (B) The sales of badminton racquets in other cities have not shown a similar increase.
- (C) The majority of the badminton racquets sold in Chennai were sold to residents of Chennai.
- (D) The sales of cricket bats and golf clubs have also shown an increasing trend in Chennai.
- (E) Badminton racquets are a popular gift item when residents of Chennai visit their relatives in other cities.

**125.** In the last one month, more than a dozen children have been attacked by Rottweilers (a large dog breed) when they stepped out of their house to play. Thus, it is unsafe to keep dogs as pets in neighbourhoods with a large population of children.

Which of the following options most strengthens the above argument?

- (A) Rottweilers have also occasionally attacked adults accompanying the children and even other dogs.
- (B) The Rottweiler is known to be a particularly ferocious dog breed that can attack at the slightest of provocations.
- (C) Small dog breeds like the Pug are very friendly towards children and can be safely kept in neighbourhoods with a large population of children.
- (D) Children need to be taught not to tease dogs or run when a dog comes towards them.
- (E) The behaviour exhibited by Rottweilers towards children is representative of the behaviour of all dogs in general.

**126.** Pointing to a photograph, an unmarried man, who has only one sister, says, 'The woman in the photograph is the maternal grandmother of my niece.' How is the woman in the photograph related to the man?

- (A) Mother
- (B) Sister
- (C) Daughter
- (D) Mother-in-law
- (E) Aunt

**Questions 127–130** consist of two or more sentences followed by four conclusions. Decide which of the given conclusions logically follows from the statements disregarding commonly known facts.

**127. Statements:** No horse is a cat. All the cats are monkeys.

- Conclusion I** No horse is a monkey.
- Conclusion II** No monkey is a horse.
- Conclusion III** Some monkeys are cats.
- Conclusion IV** All monkeys are cats.

- (A) Only II and IV are correct
- (B) Only I and III are correct
- (C) Only III and IV are correct
- (D) Only III is correct
- (E) All four conclusions are correct

**128. Statements:** Some robins are magpies. Some magpies are cranes. All cranes are swans.

- Conclusion I** Some swans are magpies.
- Conclusion II** Some cranes are robins.
- Conclusion III** No cranes are robins.
- Conclusion IV** Some magpies are robins.

- (A) Only I and II are correct
- (B) Only II and IV are correct
- (C) Only II and III are correct
- (D) Only I and IV are correct
- (E) Only II is correct

**129. Statements:** Some pastries are donuts. Some donuts are croissants. Some croissants are cakes.

- Conclusion I** Some pastries are croissants.
- Conclusion II** Some donuts are cakes.
- Conclusion III** Some cakes are croissants.

Conclusion IV Some cakes are donuts.

- (A) Only I and II are correct
- (B) Only I is correct
- (C) Only III is correct
- (D) Only II is correct
- (E) Only III and IV are correct

130. Statements: (Real NMAT Question)

- (1) Some rats are cats.
- (2) All cats are dogs.
- (3) No dog is a horse.
- (4) All horses are bulls.

Conclusion I No dog is a bull.

Conclusion II Some dogs are bulls.

Conclusion III Some dogs are rats.

Conclusion IV Some bulls are rats.

- (A) Only III follows
- (B) I, II and III follow
- (C) Either I or III and IV follow
- (D) All the conclusions follow
- (E) None of the conclusions follow

131. In a secret language 7 is coded as E, 5 is coded as R, 2 is coded as A, 1 is coded as T, 4 is coded as O, 6 is coded as L and 3 is coded as K. What does 7256 represent?

- (A) KARL
- (B) AERL
- (C) EARL
- (D) RATE
- (E) RALE

132. If HIVE is coded as 6137 and BELT is coded as 9724, how is LIVE coded?

- (A) 7213
- (B) 6197
- (C) 7321
- (D) 3124
- (E) 2137

133. In a certain code, GARAGE is written as HZSZHD. How is TRUCK written in that code?

- (A) BVLQU
- (B) UQVBL
- (C) SQTBJ
- (D) USVDL
- (E) VSUDL

134. In a certain code, if GREEK is written as HTHIP, what is the code for SPAIN?

- (A) TQBLM
- (B) TRDMS
- (C) JYTRP
- (D) LJMDI
- (E) LOIEY

135. A statement is followed by a few suggested courses of action. A course of action is a step or administrative decision to be taken for improvement, follow-up or further action in regard to the problem, policy, etc. On the basis of the information given in the statement, decide which of the suggested courses of action should logically be pursued. (Real NMAT Question)

**Statement:** Decision Review System or DRS was designed as a Player Review for players to seek the third umpire's verdict in those rare and far between cases where they strongly felt that an umpire's decision was definitely and obviously wrong. However, this hasn't been the case. For example, at the review sought by Virender Sehwag after being adjudged LBW on Malinga's ball at the world cup final—while he may have been taking a chance keeping the match situation in mind, he couldn't have known that he was off balance and on the move when he was hit. Ideally, he should have consulted his partner before asking for the review.

What should be done so that only the definitely and obviously wrong decisions are reviewed by the players?

**Decision I** DRS should be scrapped.

**Decision II** The existing system should be reviewed so that a better one could be put in place, which would prevent players from seeking reviews on decisions too frequently.

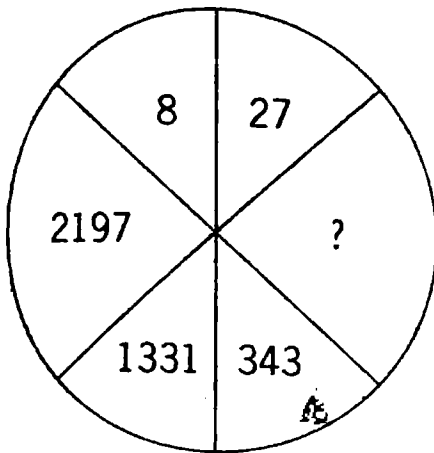
**Decision III** Strict rules about when a player can and cannot appeal for review should be enforced, and severe punishments should be meted out to players who seek reviews more often than not.

- (A) Only I should be pursued
- (B) Only II should be pursued
- (C) Only III should be pursued
- (D) Both I and II should be pursued
- (E) None should be pursued

136. What should be the next term in the series 5, 7, 12, 19, 31, 50, ...?
- (A) 63  
(B) 75  
(C) 81  
(D) 92  
(E) 101
137. What term should come in the blank in the below series?
- 1AZ, 4DW, \_\_\_\_\_, 10JQ
- (A) 6TG  
(B) 8VW  
(C) 7WX  
(D) 7GT  
(E) 8XX
138. In a certain code, 'MERCEDEEZ' is written as 'CDEEEEMRZ'. How is 'CHIMPANZEES' written in this code? *(Real NMAT Question)*
- (A) ACEEHIMNPSZ  
(B) ACEEGIHMNPS  
(C) AEEGIHMNPSC  
(D) ACEEGHIMSNP  
(E) CHIMAEENPS
139. In a certain code, LEMUR is written as MGPYW. How is ZEBRA written in that code?
- (A) VFRLY  
(B) VGEFA  
(C) AGEVF  
(D) BDESC  
(E) YRVFL
140. In a code language, if REPEL is coded as TGRGN, what is the code for ATTRACT?
- (A) CVVTCVE  
(B) BVVTCVE  
(C) BVVTEVC  
(D) CVVTCVE  
(E) CVVCTEV
141. In a certain code, VANILLA is written as XXPFNIC. How is CARPENTER written in that code?
- (A) NBVFGHYTR  
(B) RTYUHGFDI  
(C) OPIUJKLHB  
(D) MGTHYUIKT  
(E) EXTMGKVB
142. In a class, math was taken by 20, physics by 17, chemistry by 16, math and chemistry by 9, math and physics by 7, physics and chemistry by 6 and all three subjects by 5. Find the number of students who have taken only one subject. *(Real NMAT Question)*
- (A) 10  
(B) 15  
(C) 24  
(D) 26  
(E) 27
143. There are 3 couples in a family of 10 members covering 2 generations. KK has 2 brothers. Gudiya has 2 sons, Mann and Gudda. SK has one son Aryan, and is the brother-in law of Gudiya. AK has one son Shrajan and 3 nephews. Rolly is the sister in law of AK. Who is married to SK? *(Real NMAT Question)*
- (A) Data is insufficient  
(B) Gudiya  
(C) Gudiya / Rolly  
(D) Neither of them  
(E) Rolly
144. *(Real NMAT Question)*
- |   |   |   |    |   |    |   |    |   |    |   |
|---|---|---|----|---|----|---|----|---|----|---|
| a | b | c | d  | e | f  | g | h  | i | j  | k |
|   | 6 |   | 12 |   | 20 |   | 32 |   | 56 |   |
- In the table given above, the numbers representing the letters are written below the letters. For example,  $b = 6$ . It is also known that  $a + c = b$ , where  $a < c$  and  $c + e = d$ , where  $c < e$ ,  $e + g = f$ , where  $e < f$  and so on. No letter has the same number.
- What is the value of  $k - i$ ?
- (A) 12  
(B) 14  
(C) 16  
(D) 18  
(E) 20
145. In a code language, if ACERBATE is coded as TABRECAE, what is the code for BASEMENT?
- (A) NEMEASBT  
(B) MENESBAT

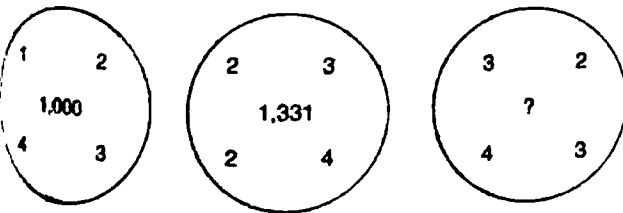
- (C) NEMESABT  
(D) NEMESATB  
(E) MENESBTA

146. What number should come in place of the question mark?



- (A) 64  
(B) 81  
(C) 125  
(D) 249  
(E) 625

147. Which number should replace the question mark?  
(Real NMAT Question)



- (A) 1,152  
(B) 1,452  
(C) 1,678  
(D) 1,728  
(E) 1,894

148. In a certain language, if SCIENCE is coded as 8-24-18-22-13-24-22, then what would be the code for HISTORY? (Real NMAT Question)

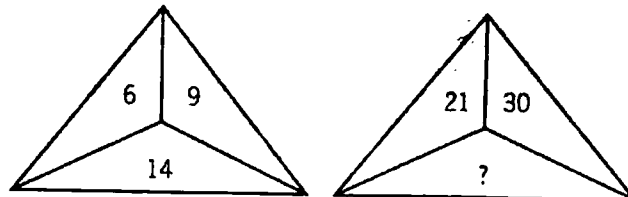
- (A) 19-18-8-17-12-9-12  
(B) 19-18-8-7-12-19-2  
(C) 19-18-8-17-12-9-2  
(D) 19-8-18-7-12-9-2  
(E) 19-18-8-7-12-9-2

149. What number should come in place of the question mark?

2	3	1	2
3	4	4	5
5	6	6	7
30	43	51	?

- (A) 52  
(B) 56  
(C) 62  
(D) 65  
(E) 70

150. What number should come in place of the question mark?



- (A) 29  
(B) 37  
(C) 41  
(D) 47  
(E) 53

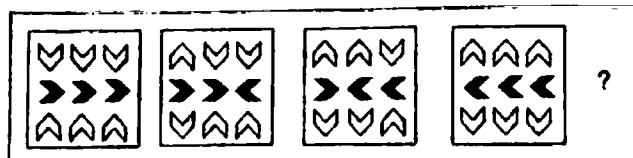
151. A man walks West for 6 kms. He then turns right and walks straight for another 8 kms. What is the shortest distance between his starting point and his end point?

- (A) 9  
(B) 10  
(C) 12  
(D) 14  
(E) 16

152. Vishal started to walk after sunrise. After going some distance, he met Sanjay who was coming from the opposite direction. Sanjay's shadow was falling to the right of Vishal. In which direction was Vishal walking?

- (A) East  
(B) West  
(C) South  
(D) North  
(E) South-west

153.



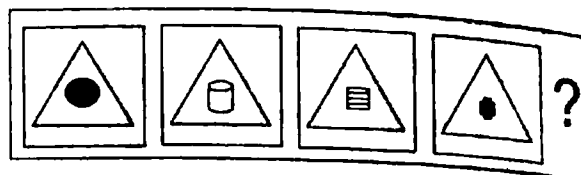
Which of the following should be the next figure in the above series?

- (A)
- (B)
- (C)
- (D)
- (E)

154. In a code language, if ALPINE is coded as 112169145, what is the code for SERPENT?

- (A) 195185142  
(B) 1206345762  
(C) 1765478954327  
(D) 195181651420  
(E) 187654356782

155.



Which of the following should be the next figure in the above series?

- (A)
- (B)
- (C)
- (D)
- (E)

156. In a code language, if VERITAS is coded as REVISAT, what is the code for LUCIFER?

(A) UCLIREF  
(B) CULIREF  
(C) CULIRFE  
(D) UCLRIFE  
(E) CULRIFE

157. In a code language, if HORIZON is coded as 8699865, what is the code for VIBGYOR?

(A) 4927679  
(B) 4972269  
(C) 4792269  
(D) 4729926  
(E) 4927769

158. What number should come next in the series 3, 9, 15, 21, 27, \_\_\_?

(A) 35  
(B) 37  
(C) 36  
(D) 33  
(E) 39

159. What number should come next in the series 2, 1,

$\frac{1}{2}, \frac{1}{4}, \underline{\hspace{1cm}}?$

(A)  $\frac{1}{2}$   
(B)  $\frac{1}{6}$   
(C)  $\frac{1}{4}$   
(D)  $\frac{1}{8}$   
(E) 0

160. Given alongside is a statement followed by two assumptions numbered I and II. An assumption is something to be taken for granted. Consider both the statement and the following assumptions, and decide which of the assumptions are implicit in the statement. (Real NMAT Question)

**Statement:** Developing countries like Brazil and India are actively lobbying against the patenting of the already-expensive life-saving drugs.

**Assumption I** Patenting of drugs will lead to a monopoly and therefore a rise in prices.

**Assumption II** Countries like Brazil and India have different mortality rates.

(A) Only I is implicit  
(B) Only II is implicit  
(C) Neither I nor II is implicit  
(D) Either I or II is implicit  
(E) Both I and II are implicit

161. How many pairs of letters in the word 'STAIRS' have as many letters between them (in either direction) in the word as in the English alphabet?

(A) None  
(B) 1  
(C) 2  
(D) 3  
(E) More than 3

162. Given alongside are a few facts. Based on these facts, select from among the given statements, the statement that can be best concluded.  
(Real NMAT Question)

**Facts:**

Fact 1: Mr. Sharma has seven cars.

Fact 2: Two of them are Sedans.

Fact 3: Two of them are Hatch-backs.

**Statements:**

I. Less than half of the cars that Mr. Sharma owns are Sedans and less than half are Hatch-backs.  
II. Three cars are SUV's.  
III. Mr. Sharma has Sedans and Hatch-backs only.

(A) Only I can be concluded  
(B) Only II can be concluded  
(C) Only III can be concluded  
(D) Only I and II can be concluded  
(E) Only I and III can be concluded

163. BABACCDEFKGGHIHJKLZMNORPQRO  
STUPVWNXYMZ

In the above alphabetical series, which is the 15<sup>th</sup> letter to the left of the 5<sup>th</sup> letter from the right?

(A) Z  
(B) L  
(C) M  
(D) N  
(E) K

164. How many pairs of letters are there in the word 'DEFAMATION' such that in the word, each pair has as many letters between them as there are in the alphabet? (*Real NMAT Question*)
- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5
165. What number should come next in the series 14.2, 28.4, 56.8, 113.6, 227.2, \_\_\_?
- (A) 424.4  
(B) 427.4  
(C) 444.4  
(D) 450.4  
(E) 454.4
166. A statement is given followed by two assumptions numbered I and II. An assumption is something to be taken for granted. Consider the statement and the assumptions, and decide which of the assumptions are implicit in the statement.  
(*Real NMAT Question*)

**Statement** The experience of the self is always a defeat for the ego.

**Assumption I** Revelation of the self is always disastrous for the ego.

**Assumption II** The ego always has an inflated notion about oneself.

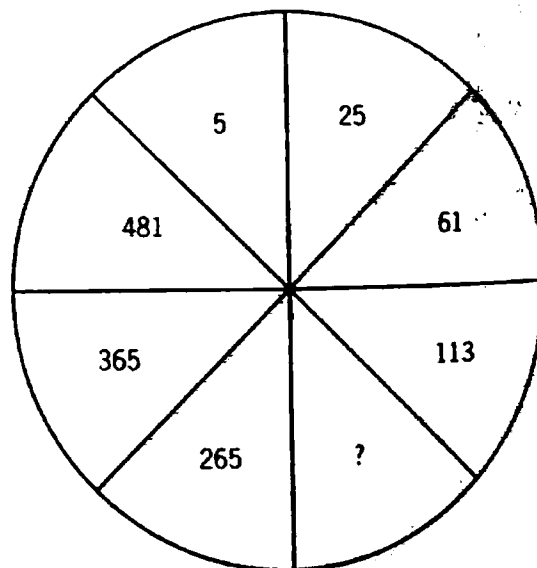
- (A) Only I is implicit  
(B) Only II is implicit  
(C) Neither I nor II is implicit  
(D) Either I or II is implicit  
(E) Both I and II are implicit
167. In the given question, there are five choices (A - E). Four of them are alike and one is different. Mark the one that is different.
- (A) Kiwi  
(B) Eagle  
(C) Dodo  
(D) Vulture  
(E) Albatross
168. Man has reached Mars but is still unable to feed everyone on Earth. (*Real NMAT Question*)
- Which of the following is implied in the above statement?

- (A) Food is scarce on Earth.  
(B) Mars is a good source of food.  
(C) Man went to Mars to explore agricultural possibilities.  
(D) Advancements in space, science and agriculture are not at par with each other.  
(E) Despite immense advancement in science, the basic need of all people on Earth is unfulfilled.

169. What number should come next in the series  $\frac{1}{10}, \frac{2}{9}, \frac{3}{8}, \frac{4}{7}, \underline{\hspace{1cm}}?$

- (A)  $\frac{5}{6}$   
(B)  $\frac{5}{7}$   
(C)  $\frac{4}{5}$   
(D)  $\frac{2}{3}$   
(E)  $\frac{6}{7}$

170. What number should come in place of the question mark?



- (A) 121  
(B) 144  
(C) 164  
(D) 181  
(E) 221

**Directions for Questions 171–174:** Based on the information given below, answer the questions that follow.  
(Real NMAT Question)

Five people, Kuldeep, Gaurav, Susmita, Pratima and Devanshu are working in three branches of a company based at Bangalore, Chennai and Hyderabad. Two people work in Bangalore and two people work in Chennai. Of these four employees, one works in Accounts and another works in Personnel. The remaining are in Marketing. There are two Assistant Managers, one Manager, one Director and one Supervisor.

1. Gaurav is the Director in the Marketing division at Chennai.
  2. Pratima is the Manager at neither the Bangalore nor the Chennai branch. She is in the Accounts department.
  3. The person in the Personnel department is an Assistant Manager in Bangalore.
  4. Susmita is at the Bangalore branch working as Supervisor and Devanshu is at the Chennai branch.
171. Who is in the Personnel department?  
(A) Devanshu  
(B) Kuldeep  
(C) Pratima  
(D) Susmita  
(E) Gaurav
  172. In what capacity is Devanshu working?  
(A) Assistant Manager in Marketing  
(B) Assistant Manager in Personnel  
(C) Supervisor in Marketing  
(D) Director in Marketing  
(E) Manager in Accounts
  173. Which of the following is correct about Kuldeep?  
(A) He is the Assistant Manager in Marketing.  
(B) He is the Assistant Manager in Personnel.  
(C) He is the Supervisor in Marketing.  
(D) He is the Director in Marketing.  
(E) He is the Manager in Accounts.
  174. Which one is the correct combination?  
(A) Gaurav–Chennai–Accounts  
(B) Pratima–Chennai–Marketing  
(C) Pratima–Chennai–Marketing  
(D) Pratima–Chennai–Marketing  
(E) Kuldeep–Assistant Manager–Personnel

175. What number should come next in the series 50, 41, 33, 26, 20, 15, \_\_\_?  
(A) 5  
(B) 7  
(C) 9  
(D) 10  
(E) 11
176. What number should come next in the series 100, 101, 99, 100, 98, 99, 97, \_\_\_?  
(A) 95  
(B) 96  
(C) 97  
(D) 98  
(E) 99
177. If Akhil is the brother of Bharati; Bharati is the sister of Chandan; Chandan is the father of Devesh. How is Devesh related to Akhil?  
(A) Son  
(B) Brother  
(C) Nephew  
(D) Grandson  
(E) Grandnephew
178. Introducing a girl, a boy said 'she is the daughter of the son of the mother of my mother's sister'. How is the girl related to the boy?  
(A) Sister  
(B) Cousin  
(C) Niece  
(D) Mother  
(E) Grandniece

**Directions for Questions 179–182:** Using the information given below, answer the following questions.  
(Real NMAT Question)

In a school, there were six teachers—Savita, Harsh, Noorie, Adarsh, Jaswinder and Monica who were assigned the task of training students in different crafts, knitting, paper recycling, baking, jute art, glass painting and paper mache. The teachers were from classes 1 to 6, and had joined the school at different dates, May 1998, Dec 2003, Dec 2004, Sep 2000, Aug 2005 and July 2010, in no particular order. Each teacher also liked to take their students out—one took the kids home, another to the lake side, two to the community centre and two to the fairs.

Some other facts known about the teachers are:



1. Savita taught Class 1, was good at knitting, had not joined the school either in September or in August.
  2. Glass painting was a craft that was NOT Monica's cup of tea. She was the latest entrant at the school.
  3. The Class 6 teacher liked to invite students home.
  4. Adarsh was not from Class 2 or Class 5, he liked to demonstrate how jute could be wetted and so often took his students to the lake side. He had not joined the school in September 2000.
  5. Harsh and Noorie, neither of whom were from Class 4 or 5, could host their school-joining anniversary party together, although they didn't join the same day.
  6. Noorie was not into paper recycling, was not from class 2 or 6, and took her students to the Community Centre just like Jaswinder.
  7. The teacher who taught Class 2 had joined the school in September 2000.
  8. The teacher from Class 3 had joined the school in December, 2004 and liked baking.
  9. The art of paper mache was taught in the Community Centre.
- 179.** Who is the teacher from Class 3?
- (A) Harsh
  - (B) Noorie
  - (C) Adarsh
  - (D) Monica
  - (E) Jaswinder
- 180.** Which class does Adarsh teach and when did he join the school?
- (A) Class 2, September '98
  - (B) Class 3, December '04
  - (C) Class 2, December '03
  - (D) Class 4, August '05
  - (E) Class 6, May '00
- 181.** What did the two people who could host their joining anniversary party together, train their students on?
- (A) Baking and knitting
  - (B) Baking and jute craft
  - (C) Baking and glass painting
  - (D) Jute craft and glass painting
  - (E) Baking and waste paper recycling
- 182.** Where does Harsh take the students?
- (A) Home
  - (B) Park
  - (C) Fair
  - (D) Either A or B
  - (E) Either B or C
- 183.** Abhishek said to Aakash, 'That boy playing with the dog is the younger of the two brothers of the daughter of my father's wife'. How is the boy playing with the dog related to Abhishek?
- (A) Brother-in-law
  - (B) Cousin
  - (C) Uncle
  - (D) Father
  - (E) Brother
- 184.** Pointing to a girl Joginder said, 'She is the daughter of my father's sister.' How is Joginder related to the girl?
- (A) Uncle
  - (B) Cousin
  - (C) Father
  - (D) Grandfather
  - (E) Nephew
- 185.** Find out the two signs to be interchanged in order to make the following equation correct:
- $$8 + 7 \times 6 / 16 - 8 = 48$$
- (A) + and -
  - (B) - and /
  - (C) + and x
  - (D) + and /
  - (E) None of the above
- 186.** One evening, Jacky and Jimmy were talking to each other face to face. If Jacky's shadow is falling to the left of Jimmy, which way is Jimmy facing?
- (A) North
  - (B) South
  - (C) East
  - (D) West
  - (E) South-west

**Directions for Questions 187–190:** A machine does a step-by-step conversion of a code so that the input code gets converted into an output using a certain logic, as shown in the table below. Study this logic and apply it to the new input provided after the table, and then answer the questions that follow. (Real NMAT Question)

Input	able	card	must	soil	coin
S1	20	26	73	55	41
S2	B	H	A	A	E
S3	ablet	cardz	mustu	solic	coino
S4	22	34	74	56	46
S5	V	H	V	D	T

New Input:

cat	mop	sin	bin	till
-----	-----	-----	-----	------

187. What will be the output of the new input?
- (A) V, H, D, V, Z  
(B) V, Z, V, H, D  
(C) D, Z, V, V, Z  
(D) D, Z, V, F, I  
(E) D, Z, V, F, K
188. What is the last element of Step 2 for the new input?
- (A) catf  
(B) 53  
(C) 61  
(D) 63  
(E) H
189. What will be the first element of the third step?
- (A) catx  
(B) catg  
(C) cath  
(D) catk  
(E) cata
190. What will be Step 2 for the new input?
- (A) E, F, G, H, H  
(B) F, H, F, G, H  
(C) 24, 25, 42, 44, 46  
(D) 24, 25, 42, 44, 53  
(E) catg, moph, sini, binj, tillh
191. Yashwantpur is to the east of Ganganagar, which is north of Zirakpur. If Pathanpur is to the south of Zirakpur, then in which direction from Pathanpur is Yashwantpur?
- (A) North  
(B) South-east
- (C) North-east  
(D) West  
(E) South-west
192. If  $\times$  stands for 'addition',  $-$  stands for 'subtraction',  $+$  stands for 'multiplication' and  $\div$  stands for 'division', then  $40 \times 16 \div 16 - 8 + 10 = ?$
- (A) 5  
(B) 24  
(C) 25  
(D) 36  
(E) 80
193. A man walks 3 km South and then turns to the right. After walking 8 km he turns to the left and walks 4 km. Then he takes a  $180^\circ$  turn. In which direction from the starting place is he now standing?
- (A) West  
(B) South  
(C) North-east  
(D) South-west  
(E) South-east
194. Kamal starts walking from his home one morning at 10, and walks in a straight line for 1 hour. All this while, his shadow was falling on his left. At the end of his walk, Kamal turned  $90^\circ$  in the anti-clockwise direction. Which direction is Kamal facing now?
- (A) North  
(B) South  
(C) East  
(D) West  
(E) South-west
195. Raghav and Arvind, two brothers, were playing in an open ground. While playing, they followed certain paths described below, each of them starting from the same initial point. (*Real NMAT Question*)
- Raghav started walking towards the north for 50 metres, then turned to his right and walked for 80 metres, after which he turned to his left and walked for 20 metres.
- Arvind started walking towards the west for 30 metres and then turned to his right and proceeded for 40 metres.
- Identify the direction of Raghav with respect to Arvind.
- (A) North-east  
(B) North-west  
(C) South-east

- (D) South-west  
(E) Cannot be determined

196. Directions: Study the matrices and determine the digits that comprise the given word.  
(Real NMAT Question)

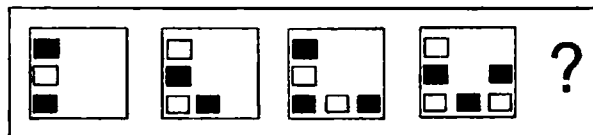
	0	1	2	3	4
0	M	N	O	P	Z
1	Q	J	G	E	D
2	P	I	R	G	S
3	F	N	B	W	V
4	M	Y	U	I	O

	5	6	7	8	9
5	S	R	P	B	A
6	W	K	L	V	C
7	I	F	H	E	S
8	O	J	P	E	I
9	B	H	S	K	M

### POISE

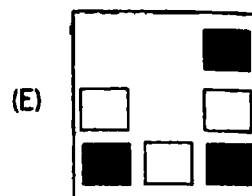
- (A) 03, 85, 43, 87, 78  
(B) 03, 85, 89, 24, 32  
(C) 20, 02, 75, 79, 13  
(D) 57, 10, 89, 97, 88  
(E) 87, 44, 21, 55, 77

197.



Which of the following should be the next figure in the above series?

- (A)
- (B)
- (C)
- (D)



198. Proponents of law that require drivers to wear seat belts argue that in a democracy, one is allowed to take risk as long as the risk is limited to oneself, and no harm is done to the others as a result of the risk taking. They, therefore, conclude that wearing a seat belt or not cannot be left upon the individual to decide. (Real NMAT Question)

Which of the following, if true, would most seriously strengthen the conclusion drawn above?

- (A) Seat belts are mandatory even in an airplane.  
(B) The number of passengers who do not wear seat belts is higher in comparison to those who do wear seat belts.  
(C) Technological advancements will see cars with automatic seat belt fasteners taking care of people who do not wear their seat belts.  
(D) Insurance rates for all the automobile owners is more because of their need to pay for increased injuries or deaths of people caused by accidents.  
(E) The percentage of fatalities, in places that do not have a law that makes the wearing of seat belts compulsory, is higher in comparison to places with such a law.

199. Aarushi is an incompetent software engineer. During her four years of career at 'X' Technologies, she has been involved only in four projects. (Real NMAT Question)

Which of the following statements, if true, would most weaken the above argument?

- (A) 'X' Technologies has taken on more than 10 projects in the past four years.  
(B) Her manager doesn't like her personally and that is why she doesn't involve her in projects.  
(C) Aarushi has been out of the country for various trainings and thus could not involve herself in more projects.  
(D) Aarushi is a specialist software engineer with high troubleshooting skills, and that is why she is chosen for select high-risk and high-stakes projects.  
(E) Aarushi takes five times longer than any other employee to complete a task and that is why her involvement in numerous projects was impossible.

**Directions for Questions 200–203:** Read the below information and answer the questions that follow on the basis of this information.

Nine people, Richard, Emmanuel, Luke, Andre, Patrick, Ethan, Jason, Shane and Joshua, stay on different floors of a 9-storey building. All of them own one car each, and each car is of a different colour: blue, white, grey, black, green, yellow, orange, red and pink, not necessarily in that order. The ground floor is numbered 1 and the topmost floor is numbered 9.

- Shane owns a black coloured car and stays on an even numbered floor. Richard stays on any even numbered floor below the floor on which Shane stays. The person who owns the orange coloured car stays on the fourth floor.
- Patrick stays on the second floor and owns the white coloured car. The person who owns a pink coloured car stays on the third floor. Richard does not own a green coloured car. There are two floors between the floors on which the people owning the red and the black coloured cars stay.
- Luke owns a grey coloured car. There are three floors between the floors on which Luke and Jason stay. Andre stays on a floor immediately above Joshua's floor. There is one floor between the floors on which Ethan and Jason stay.
- Ethan does not own the pink coloured car and does not stay on the ground floor. The person who owns the blue car stays on the top-most floor.

200. Who stays on floor number 8?

- (A) Emmanuel
- (B) Andre
- (C) Richard
- (D) Ethan
- (E) Shane

201. How many persons are staying between Jason and Emmanuel?

- (A) Three
- (B) Four
- (C) Two
- (D) One
- (E) None of these

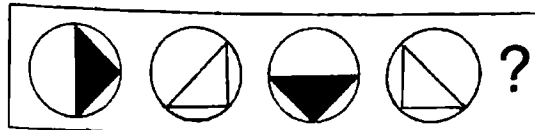
202. Who stays on the floor immediately below Joshua's floor?

- (A) Ethan
- (B) Andre
- (C) Patrick
- (D) Richard
- (E) Emmanuel or Luke

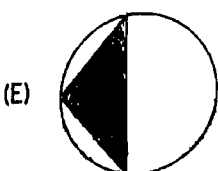
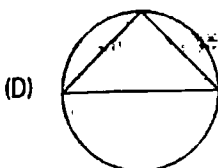
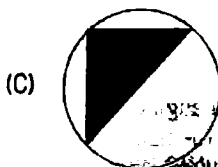
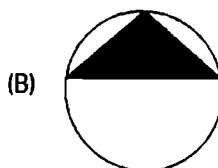
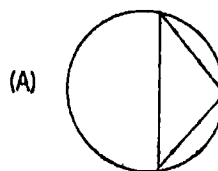
203. Who owns the yellow coloured car?

- (A) Andre
- (B) Ethan
- (C) Emmanuel
- (D) Richard
- (E) Luke

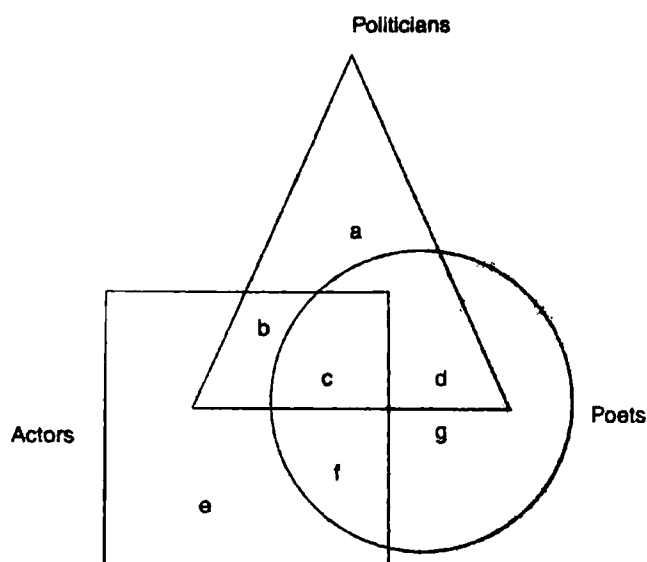
204.



Which of the following should be the next figure in the above series?



205. The triangle represents Politicians, the square represents Actors and the circle represents Poets. Which one of the following areas represents Politicians who are Poets but not Actors?  
(Real NMAT Question)



- (A) a  
(B) b  
(C) c  
(D) d  
(E) e
206. In a family of six members, there are an equal number of males and females. C is the father of A and F while A is the granddaughter of B. E is the mother of C. D is another member in the family. There are two married couples in the family.  
(Real NMAT Question)
- Which of the following is the list of male members in the family?
- (A) BCD  
(B) BCE  
(C) BCF  
(D) CDE  
(E) CDF
207. Study the matrices and determine the digits that comprise the given word. (Real NMAT Question)

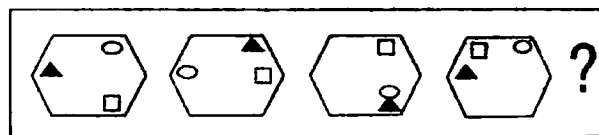
	0	1	2	3	4
0	D	N	O	L	Z
1	M	R	B	E	U
2	U	S	A	P	M
3	Q	C	F	D	O
4	E	K	N	G	L

	5	6	7	8	9
5	E	O	B	N	H
6	Z	Y	R	J	D
7	A	C	U	F	A
8	J	W	S	H	G
9	U	N	Q	E	B

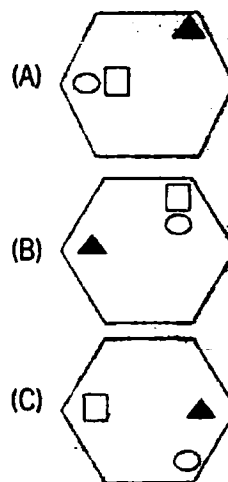
## UNANNOUNCED

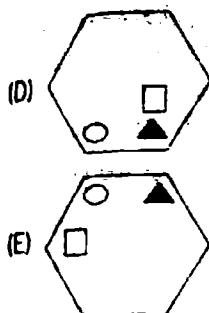
- (A) 14, 01, 22, 01, 01, 55, 33, 97, 76, 55, 69  
(B) 14, 42, 22, 96, 58, 56, 24, 01, 76, 55, 69  
(C) 20, 58, 79, 96, 01, 34, 95, 89, 76, 55, 69  
(D) 77, 01, 75, 42, 58, 56, 20, 96, 31, 98, 00  
(E) 77, 58, 75, 96, 58, 57, 55, 01, 31, 98, 00
208. Assam produces nearly 95% of the tea leaves in India, out of which almost 50% of the tea leaves are of Quality-X. The price of Quality-X tea leaves is 15 times more in the export market than in the domestic market. Some tea leaves are of Quality-Y and are sold in the domestic market. A small proportion of Quality-X tea leaves is used in India; the rest is exported. (Real NMAT Question)
- Which of the following statements can be inferred from the information given above?
- (A) Indians do not like Quality-X tea leaves.  
(B) Quality-X tea leaves are preferred in export.  
(C) India should not export Quality-X tea leaves.  
(D) More than 50% of Quality-X tea leaves are exported.  
(E) Tea leaves produced in India are only of two qualities.

209.

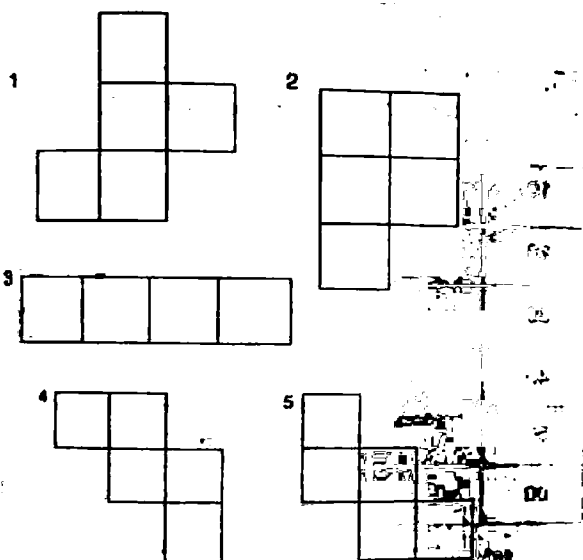


Which of the following should be the next figure in the above series?



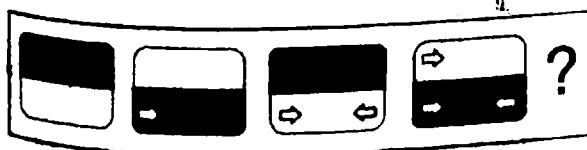


210. Which figure cannot be folded to form a cube-shaped box with an open top? (*Real NMAT Question*)

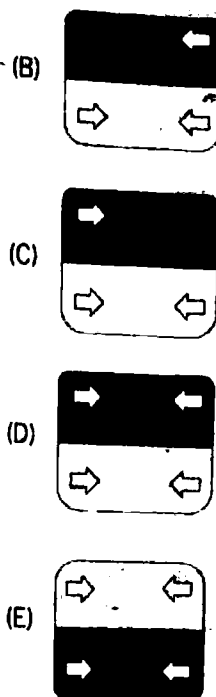


- (A) 2 only  
(B) 3 only  
(C) 2 and 3 only  
(D) 2, 3 and 4 only  
(E) 2, 3 and 5 only

211.



Which of the following should be the next figure in the above series?

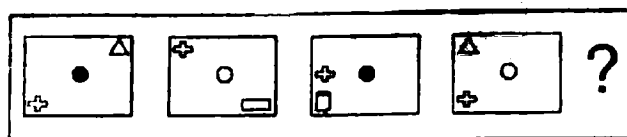


212. There were different types of dishes that were laid out on the table including a couple of sweet dishes. Mr X was seen avoiding the sweet dishes despite many others making a beeline for a second helping. The hostess even overheard Mr X asking a caterer if the lemonade being served was sweetened. (*Real NMAT Question*)

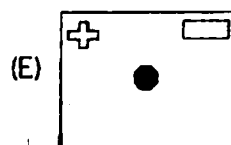
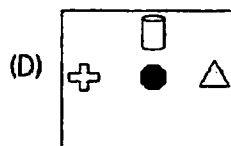
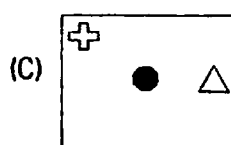
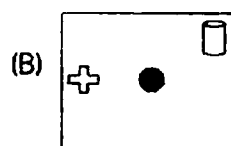
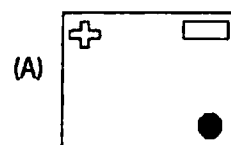
Which of the following is a good inference by the hostess?

- (A) Mr X likes it when he is served sweet dishes.  
(B) Mr X is either diabetic or health conscious.  
(C) Mr X dislikes the cook who made the sweet dishes.  
(D) Mr X likes to have sweets either with his wife or from his wife.  
(E) Mr X prefers sweets at afternoon meals and prefers mild sweets.

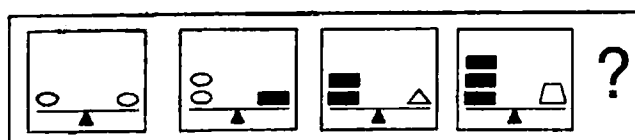
213.



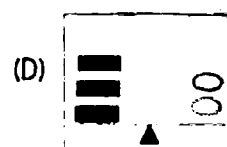
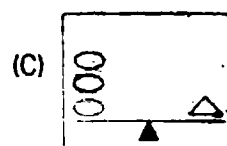
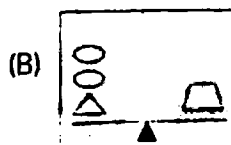
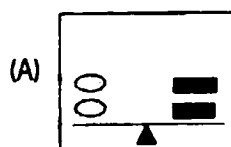
Which of the following should be the next figure in the above series?



214



Which of the following should be the next figure in the above series?



215. What is the value of  $(A + B + C + D)$  in the matrix given below? (Real NMAT Question)

10					
20	A				
30	B	C			
40	90	80	70		
50	100	D	80	70	
60	50	40	30	20	10

- (A) 260  
(B) 270  
(C) 290  
(D) 300  
(E) 310

Directions for Questions 216–219: A machine processed the following input according to a certain rule to reach a final output. (Real NMAT Question)

Input: 32, panorama, 48, casualty, 23, wide, 4, nation, routine

Step I: casualty, 32, panorama, 48, 23, wide, nation, routine, 4

Step II: casualty, nation, 32, panorama, 48, wide, routine, 4, 23

Step III: casualty, nation, panorama, 48, wide, routine, 4, 23, 32

Step IV: casualty, nation, panorama, routine, wide, 4, 23, 32, 48

Step IV is the final output.

A new input is processed by the machine on the basis of the same rule.

New Input: 29, zoo, 36, yeast, 9, prices, 16, manoeuvre, toxicity

216. Which of the following will be Step II for the new input?

- (A) manoeuvre, 29, zoo, 36, yeast, prices, 16, toxicity, 9
- (B) manoeuvre, prices, 29, zoo, 36, yeast, toxicity, 9, 16
- (C) manoeuvre, prices, 29, zoo, 36, yeast, toxicity, 16, 9
- (D) manoeuvre, 29, zoo, 36, yeast, prices, toxicity, 9, 16
- (E) manoeuvre, prices, zoo, 36, yeast, toxicity, 29, 16, 9

217. Which of the following will be the final output for the new input?

- (A) Step III
- (B) Step IV
- (C) Step V
- (D) Step VI
- (E) Step VII

218. Which will be the correct sequence of numbers from left to right in Step III of the new input?

- (A) 36, 16, 9, 29
- (B) 36, 9, 16, 29
- (C) 29, 36, 9, 16
- (D) 36, 29, 9, 16
- (E) 9, 16, 36, 29

219. Which of the following is Step II in reverse order for the new input?

- (A) 9, 16, toxicity, yeast, 36, zoo, 29, manoeuvre, prices
- (B) 29, 36, yeast, toxicity, 16, 9, zoo, manoeuvre, prices
- (C) 16, 9, yeast, toxicity, 36, 29, zoo, prices, manoeuvre
- (D) 9, 16, manoeuvre, prices, 29, zoo, 36, yeast, toxicity
- (E) 16, 9, toxicity, yeast, 36, zoo, 29, prices, manoeuvre

220. Study the matrices and determine the digits that comprise the given word. (*Real NMAT Question*)

	0	1	2	3	4
0	R	M	W	R	I
1	F	K	A	F	O
2	K	P	F	K	T
3	K	L	F	G	T
4	C	E	G	I	L

	5	6	7	8	9
5	V	C	D	E	H
6	J	N	Q	S	U
7	V	X	Y	Z	A
8	B	D	H	J	M
9	N	O	P	Q	S

## INDIA

- (A) 43 95 86 34 14
- (B) 40 66 75 04 12
- (C) 40 59 75 43 12
- (D) 04 66 57 43 12
- (E) 34 59 68 43 14

**Directions for Questions 221–224:** A machine rearranges some numbers based on a certain rule. The following arrangement illustrates the pattern of steps that the machine follows. Step V is the final output. (*Real NMAT Question*)

Input: 45, 18, 13, 29, 46, 41, 43, 16, 33, 11

Step I: 11, 45, 18, 13, 29, 46, 41, 43, 33, 16

Step II: 11, 13, 45, 29, 46, 41, 43, 33, 16, 18

Step III: 11, 13, 29, 45, 46, 41, 43, 16, 18, 33

Step IV: 11, 13, 29, 41, 46, 43, 16, 18, 33, 45

Step V: 11, 13, 29, 41, 43, 16, 18, 33, 45, 46

Answer the question that follows assuming that the new input given below is processed by the machine in the same manner.

New Input: 23, 21, 7, 14, 17, 25, 19, 38, 27, 13

221. Which will be the third number from the right in Step III for the new input?

- (A) 13
- (B) 14
- (C) 17
- (D) 19
- (E) 21

222. Which of the following will be the final step for the new input?

- (A) Step III
- (B) Step IV
- (C) Step V
- (D) Step VI
- (E) Step VII

223. The positions of which of the following numbers remain unchanged from Step II to Step V?



- (A) Only 7
- (B) 7 and 13
- (C) 7, 13 and 14
- (D) 7, 13 and 21
- (E) 7, 13 and 38

224. What would be the final step of the new input, in reverse order, and then subtracting 1 from every alternate number starting from the first?

- (A) 6, 17, 12 19, 22, 14, 20, 25, 26, 38
- (B) 38, 26, 25, 20, 14, 22, 19, 16, 13, 6
- (C) 37, 26, 24, 20, 13, 6, 12, 16, 18, 22
- (D) 37, 27, 24, 21, 13, 23, 18, 17, 12, 7
- (E) 7, 17, 13 19, 23, 14, 21, 25, 27, 38

225. The Government has appointed bureaucrats and politicians as heads of various sports institutions. As they do not have the necessary understanding of the sports that is mandatory for the effective functioning of these institutions, they have made some wrong decisions. **(Real NMAT Question)**

Which of the following statements can be concluded from the information given above?

- (A) Bureaucrats can become the heads of sports institutions, but not politicians.
- (B) All bureaucrats and politicians are responsible for the wrong decisions made.
- (C) The Government should replace all bureaucrats and politicians with new faces.
- (D) The heads of different sports institutions should be persons who are involved in the sport.
- (E) The Government is not making the right decisions and should be changed immediately.

226. Petroleum and its by-products such as petrol and diesel cause a lot of pollution and increase our carbon footprint. Over the last few years, petrol and diesel have been replacing other non-renewable fuels thereby polluting the atmosphere and as a result, affecting health. The condition is particularly bad in cities like Delhi and Mumbai.

**(Real NMAT Question)**

Which of the following weakens the argument?

- (A) Petrol causes less pollution as compared to diesel.
- (B) Petrol and diesel have been replacing fuels like coal, which are even more dangerous.
- (C) Petrol and diesel virtually run our economy. Without these fuels, we would be back in prehistoric ages.

- (D) The use of solar energy has severe limitations and hence cannot replace non-renewable fuels like petrol.
- (E) Indian companies are adopting new technologies to reduce pollution and selling carbon credits in the international market.

**Directions for Questions 227–230:** Based on the information given below, solve the questions that follow. **(Real NMAT Question)**

A debating team of 5 students is to be selected from 3 boys (X, Y and Z) and 5 girls (P, Q, R, S and T). T and Y, R and S, and Q and T cannot be selected together in the team.

227. If X is selected as one of the only two boys in the team, and Z is not among them, then how many teams are possible?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

228. In how many ways can a team be selected fulfilling all conditions, if X is always a part of that team?

- (A) 5
- (B) 7
- (C) 8
- (D) 11
- (E) 15

229. If Q and R are always in the team, then in how many ways can the team be selected?

- (A) 2
- (B) 4
- (C) 6
- (D) 8
- (E) Cannot be determined

230. Which of the following can be a feasible replacement for a member of an already selected team, satisfying all conditions?

- (A) R in place of Q
- (B) Y in place of Z
- (C) Y in place of X
- (D) R in place of S
- (E) Q in place of S

231. Fill in the blank in the series: **(Real NMAT Question)**

2, 18, 84, \_\_\_\_, 630

- (A) 122  
(B) 148  
(C) 194  
(D) 226  
(E) 260

232. Study the matrices and determine the digits that comprise the given word. (*Real NMAT Question*)

	0	1	2	3	4
0	D	E	F	Y	M
1	U	A	E	Z	Q
2	L	T	R	S	T
3	P	Q	O	T	I
4	M	W	P	M	J

	5	6	7	8	9
5	T	E	U	R	T
6	G	A	Q	T	D
7	F	S	Q	A	K
8	S	Q	I	Q	R
9	W	O	M	O	E

### TORQUE

- (A) 21, 96, 22, 98, 10, 56  
(B) 33, 00, 69, 31, 57, 10  
(C) 55, 98, 58, 14, 56, 12  
(D) 59, 32, 89, 31, 57, 12  
(E) 67, 32, 89, 00, 10, 99

233. Mansi was well known for her courageous and hardworking nature, as well as for her selfless works of charity. (*Real NMAT Question*)

What can be logically concluded from the above statement?

- (A) Mansi is a very nice human being.  
(B) If you don't do charity, you are not selfless.  
(C) Those who are courageous and unselfish are well known.  
(D) Mansi worked hard with both courage and a selfless attitude.  
(E) Due to the charitable work that Mansi did, she became well known.

234. Answer the question below based on the following information. (*Real NMAT Question*)

- I. 'A × B' means 'A is the mother of B'.  
II. 'A # B' means 'A is the sister of B'.  
III. 'A + B' means 'A is the brother of B'.  
IV. 'A - B' means 'A is the father of B'.

Which of the following means 'A is the cousin of B'?

- (A) A # C + B  
(B) A + C # B  
(C) A × C + B

- (D) A - C # D × B  
(E) None of the above

235. A is the mother of B. C is the father of D. E is the aunt of F. B is not the son of A. D is not the daughter of C. B, D and F are siblings. F is not the brother of B. How many male members are there in the family? (*Real NMAT Question*)

- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5

236. In a certain code language, time is called watch, watch is called strap, strap is called leather, leather is called animal, animal is called brown, brown is called biscuit, biscuit is called colour and colour is called time.

If the person wants to write 'The strap of the watch is brown in colour', then how will it be written in the code? (*Real NMAT Question*)

- (A) The brown of the strap is biscuit in time  
(B) The leather of the strap is biscuit in time  
(C) The watch of the strap is leather in time  
(D) The animal of the time is biscuit in watch  
(E) The brown of the leather is animal in time

237. A survey by a certain TV channel came up with results that were along expected lines. The viewers complained that all soaps felt the same, the soaps' formats had not changed in many years and that they were bored with the same storyline that each soap presented. (*Real NMAT Question*)

The TV producer was therefore right when he decided to:

- (A) bring in a variety of soaps for different age groups.  
(B) bring in new writers of soaps to provide variety.  
(C) introduce some new laughter-reality shows.  
(D) issue ultimatums to existing writers.  
(E) do all mentioned in A, B and C.

238. If MAT = 20113 and FILE = 51296, then what is the code of TRUCK? (*Real NMAT Question*)

- (A) 113212108  
(B) 028131180  
(C) 110218013  
(D) 113211820  
(E) 121301800

239. Study the matrices and determine the digits that comprise the given word.

	0	1	2	3	4
0	M	B	Q	W	U
1	S	N	I	Z	B
2	O	T	U	J	A
3	R	E	C	H	T
4	B	T	E	I	S

	5	6	7	8	9
5	T	A	B	L	K
6	X	I	O	E	S
7	W	U	P	B	Q
8	I	T	T	V	M
9	S	E	B	F	U

### SUBSTITUTE

- (A) 10, 04, 14, 44, 21, 12, 34, 23, 55, 42  
 (B) 44, 99, 78, 69, 21, 43, 86, 77, 41, 31  
 (C) 69, 22, 01, 95, 55, 85, 41, 99, 34, 96  
 (D) 69, 76, 97, 95, 41, 85, 88, 04, 21, 68  
 (E) 95, 99, 57, 10, 34, 66, 65, 76, 87, 96

**Questions 240–241** consist of a statement followed by two assumptions. You have to consider the statement and the two assumptions and decide which of the assumptions is implicit in the statement. Select from the following options:

- (A) Only I is an assumption  
 (B) Only II is an assumption  
 (C) Either I or II is an assumption  
 (D) Neither I nor II is an assumption  
 (E) Both I and II are assumptions

- 240. Statement:** Strong communication skills cannot be the only criteria for becoming a successful entrepreneur, as has been exemplified in several recent entrepreneurial success stories.

**Assumption I** At least some entrepreneurs who have become successful recently do not have particularly strong communication skills.

**Assumption II** At least some entrepreneurs who have become successful recently have strong communication skills.

- 241. Statement:** Football needs physical skills and chess needs intellectual skills. Thus Indian students should focus on playing chess.

**Assumption I** Playing chess is more lucrative than playing football.

**Assumption II** Indian students are better at intellectual pursuits than they are at physical pursuits.

- 242.** The mayor of Newtown is up for re-election in a month's time and is extremely apprehensive of his chances. According to a recent survey conducted by a news channel in Hampstead, Newtown's most

populous suburb, more than 80 percent of the respondents stated that they would not vote for the current mayor.

The mayor's apprehensions are based on which of the following assumptions?

- (A) The people who were part of the survey will in no case change their mind.  
 (B) The opinion of the residents of Hampstead is a pretty accurate representation of the opinion of the residents of Newtown as a whole.  
 (C) The mayor was recently involved in a corruption scandal that received a lot of negative publicity in the print media.  
 (D) The mayor did not do enough to help the victims of the hurricane that struck Newtown last year.  
 (E) In the last three elections for the post of the mayor in Newtown, the incumbent mayor has never been re-elected to office.

**Directions for Questions 243–246:** Read the following information and answer the questions that follow.

Six friends—S, R, P, D, M and K—are sitting around a circular sofa. S is sitting opposite to R. P is sitting to the right of R but left of D. M is sitting to the left of R. K is sitting to the right of S and left of M. Now, D and K interchange their positions and so do M and R.

- 243.** Who will be sitting second to the right of D?

- (A) S  
 (B) M  
 (C) R  
 (D) P  
 (E) K

- 244.** Four of the following five pairs are alike in a certain way based on their positions in the above arrangement and so form a group. Which of the following pairs do not belong to the group?

- (A) SR  
 (B) DM  
 (C) PS  
 (D) KM  
 (E) RP

- 245.** Who will be sitting opposite to S?

- (A) R  
 (B) M  
 (C) K  
 (D) D  
 (E) P

246. Who will be sitting to the immediate left of K?

- (A) P
- (B) D
- (C) R
- (D) S
- (E) None of these

247. Introducing Rajesh, Kavita said, 'His brother's father is the only son of my grandmother.' How is Rajesh related to Kavita?

- (A) Nephew
- (B) Son
- (C) Husband
- (D) Brother
- (E) Father

248. It is extremely unlikely that the incumbent governor will be voted back into office in the coming elections. According to a recent survey of residents of the state, more than 80% expressed dissatisfaction with the governor's performance and almost 60% stated that they would vote for the governor's opponent.

Which of the following most strongly supports the argument?

- (A) The views of most of the state's residents are in concordance with the views of the survey's respondents.
- (B) The governor has received a lot of bad publicity in the past owing to his involvement in a corruption scandal.
- (C) The survey only covered a small fraction of the state's populace.
- (D) The governor's opponent is very popular amongst the residents of the state.
- (E) The newspapers in the state are against the governor and favour his opponent instead.

249. Study the matrices and determine the digits that comprise the given word.

	0	1	2	3	4
0	M	N	O	P	Z
1	Q	J	G	E	D
2	P	I	R	G	S
3	F	N	B	W	V
4	M	Y	U	I	O

	5	6	7	8	9
5	S	R	P	B	A
6	W	K	L	V	C
7	I	F	H	E	S
8	O	J	P	E	I
9	B	H	S	K	M

FLOWER

- (A) 76 67 44 34 13 22

- (B) 30 67 02 65 78 56
- (C) 76 67 85 32 13 23
- (D) 30 67 86 65 88 56
- (E) 76 67 02 33 12 56

**Directions for Questions 250–253:** Read the below information and answer the questions that follow.

In an exhibition, seven motorcycles—LML, Bajaj, Yamaha, Indian, Ducati, Harley, Triumph—are parked facing North in a straight line.

- (I) LML is to the right of Bajaj
- (II) Yamaha is fourth to the left of Bajaj
- (III) Indian is between Ducati and Triumph
- (IV) Yamaha, which is third to the left of Ducati, is at one end

250. Which motorcycle is parked to the left of Ducati?

- (A) Bajaj
- (B) Harley
- (C) Triumph
- (D) Indian
- (E) Yamaha

251. Which motorcycle is at the fourth position when moving from East to West?

- (A) Ducati
- (B) Harley
- (C) Indian
- (D) Triumph
- (E) Bajaj

252. Which of the following is a correct statement?

- (A) Yamaha and LML are parked next to each other.
- (B) Harley is not parked at one end.
- (C) Indian is parked to the right of Ducati.
- (D) Triumph is between Yamaha and Indian.
- (E) Ducati and Harley have one motorcycle between them.

253. Which of the following is an incorrect statement?

- (A) Harley is not parked at one of the ends.
- (B) Ducati is not parked to the right of Bajaj.
- (C) LML is not parked between Yamaha and Indian.
- (D) Ducati and Harley have exactly two motorcycles parked between them.
- (E) Indian is not parked in the centre of the group.

**Questions 254–255** contain two statements that are followed by two conclusions. You need to decide which of the given conclusions logically follows from the statements,

disregarding commonly known facts. Select your choices from the following options:

- (A) Only Conclusion I follows
- (B) Only Conclusion II follows
- (C) Either Conclusion I or II follows
- (D) Neither Conclusion I nor II follows
- (E) Both Conclusions I and II follow

**254. Statements:** All rings are pods. Some pods are violets.

**Conclusion I** Some rings are violets.

**Conclusion II** All pods are rings.

**255. Statements:** Some crows are doves. All doves are sparrows.

**Conclusion I** Some crows are sparrows.

**Conclusion II** All crows are sparrows.

**Directions for Questions 256–259:** Read the following information and answer the questions that follow.

Seven friends—P, T, M, J, V, R and W—are pursuing B.Com, B.A. and B.Sc courses. Three of them are pursuing B.Com, two are pursuing B.A. and two are pursuing B.Sc. Each of them has a favourite musical instrument ranging from banjo, sitar, guitar, flute, violin, saxophone and tabla but not necessarily in the same order. None of those pursuing B.Com like either sitar or violin. M is pursuing B.A. and he likes banjo. R is pursuing B.Sc and likes tabla. J is pursuing B.Com and likes guitar. P, who does not like sitar, is pursuing the same discipline as R. T is pursuing the same discipline as M. V does not like saxophone.

**256.** Who among the following is pursuing B.Com?

- (A) J, V and W
- (B) V, W and T
- (C) J, V and T
- (D) J, P and R
- (E) None of the above

**257.** What is the favourite musical instrument of M?

- (A) Flute
- (B) Sitar
- (C) Guitar
- (D) Banjo
- (E) Saxophone

**258.** What are the favourite musical instruments of those who are pursuing B.Sc?

- (A) Guitar and Violin
- (B) Sitar and Tabla
- (C) Tabla and violin
- (D) Flute and sitar
- (E) Violin and saxophone

**259.** Which of the following combinations is correct?

- (A) J – B.A. - Guitar
- (B) M – B.Com - Banjo
- (C) T – B.A. - Tabla
- (D) T – B.Sc - Sitar
- (E) W – B.Com - Saxophone

**260.** In a certain code, PATNA is written as QZUMB. How will NEPAL be written in this code?

- (A) OFQZP
- (B) MDQZK
- (C) OFQZM
- (D) MFOBK
- (E) ODQZM

**261.** Prakash introduces Sunita as the daughter of the sister of his sister's mother. How is Sunita related to Prakash?

- (A) Aunt
- (B) Mother
- (C) Sister
- (D) Cousin
- (E) Daughter

## 7.2 Answers and Explanations

The following discussion on answers and explanations is intended to familiarise you with the most efficient and effective approaches to these kinds of questions. Remember that it is the problem solving strategy that is important, not the specific details of a particular question.

Questions 1-6 consist of a statement followed by two arguments numbered I and II. Decide which of the Arguments is strong. Select from the following options.

- (A) Only argument I is strong
- (B) Only argument II is strong
- (C) Either argument I or II is strong
- (D) Neither argument I nor II is strong
- (E) Both arguments I and II are strong

1. **Statement:** Should exemptions be provided to industries that are set up in underdeveloped areas.

**Argument I** No. The only goal of these industries is to maximise profits.

**Argument II** Yes. This will help generate employment in backward areas.

There is nothing wrong if these industries want to maximise profits. That, in fact, should be the goal of every industry. Thus, Argument I is weak.

Argument II, on the other hand, gives a logical reason for providing exemptions to these industries. Thus, Argument II is strong.

The correct answer is B.

2. **Statement:** Should taxes, especially those on income, be abolished in India?

**Argument I** No. This is an important source of funds for the government to spend on development of infrastructure and so on.

**Argument II** Yes. This provides no benefits to the people who pay these taxes.

Taxes are an important source of funds for the government, so Argument I is definitely strong.

It is not correct to say that the taxpayers do not benefit from paying taxes, because it is this money that the government spends on infrastructure development, the benefits of which accrue to all citizens of the country. Thus, Argument II is weak.

The correct answer is A.

3. **Statement:** Should export of essential items, such as wheat, be banned from India?

**Argument I** Yes. The first right on the use of these items is of the people of India

**Argument II** No. Other countries might retaliate and ban the export of some of their products to India.

Argument I is based on the assumption that there is not enough of these essential items available for use by the people of India, so why export? But the statement mentions no such thing. What if there is still a huge quantity of wheat available? Then, it might be a good idea to export this and earn some foreign exchange. Thus, Argument I is weak.

We do not know the nature of the products whose exports other countries might ban. If these are non-essential products, then we may not really care whether their exports are allowed to India or not. Thus, Argument II is also weak.

The correct answer is D.

4. **Statement:** Should all the illegal construction that has been carried out in the city by unscrupulous builders be demolished?

**Argument I** Yes. This will dissuade such builders from carrying out such activities in future and also punish people for buying such properties.

**Argument II** No. There are people living in these buildings who will have nowhere to go.

Since these are illegal structures, they must be demolished. Thus, Argument I is strong. The people who are living in these structures must have been aware that these are illegal. Thus, there is no justification for their actions, making Argument II weak.

The correct answer is A.

5. **Statement:** Should India spend resources on developing renewable sources of energy, such as solar and wind, to meet its energy needs?

**Argument I** Yes. The current sources of energy will eventually get completely used up.

**Argument II** No. India will have to spend a huge amount of money on developing these sources of renewable energy.

If all your current sources of energy will eventually get used up, you need to develop some other sources of energy for the future. Thus, Argument

I is strong because it gives a logical reason for developing renewable sources of energy.

Just because it will cost a lot of money does not mean India can avoid developing renewable sources of energy. In fact, if it does not do so, it might end up spending even more money trying to make up for the shortfall in the availability of energy from conventional sources. Thus, Argument II is weak.

**The correct answer is A.**

6. **Statement:** Has the easy availability of consumer loans made life easier for the Indian consumer?

**Argument I** Yes. The consumers can now buy items that they couldn't afford earlier.

**Argument II** No. The easy availability of these loans can make consumers buy unnecessary things.

Both the arguments make logically valid points and are strong.

**The correct answer is E.**

7. Study the matrices and determine the digits that comprise the given word.

	0	1	2	3	4
0	P	L	E	B	N
1	U	C	E	M	E
2	N	V	A	R	Y
3	Y	I	F	Y	S
4	R	M	C	U	E

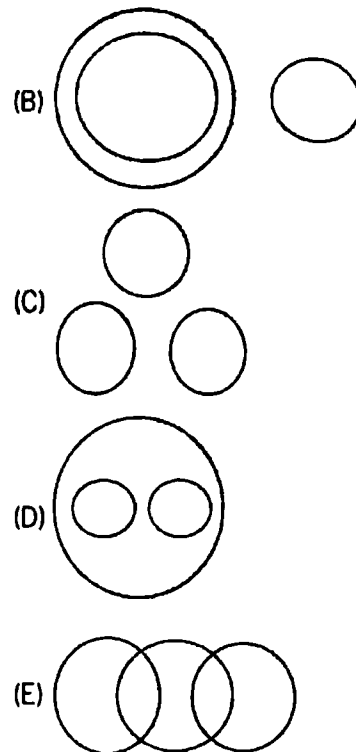
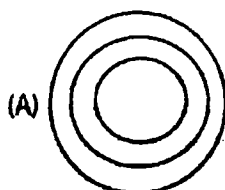
	5	6	7	8	9
5	A	G	L	R	W
6	I	Y	K	F	M
7	U	L	Y	U	I
8	L	S	P	T	P
9	N	Y	A	C	L

### LUMINARY

- (A) 75, 78, 14, 31, 40w, 22, 40, 96  
 (B) 85, 78, 13, 79, 04, 97, 58, 97  
 (C) 76, 10, 41, 31, 14, 22, 23, 77  
 (D) 85, 78, 13, 32, 04, 97, 58, 33  
 (E) 85, 78, 13, 79, 04, 97, 58, 33  
 $85 = L$ ,  $78 = U$ ,  $13 = M$ ,  $79 = I$ ,  $04 = N$ ,  $97 = A$ ,  
 $58 = R$ ,  $33 = Y$

**The correct answer is E.**

8. Which of the following diagrams indicates the best relation between tea, coffee and beverages?



All tea and coffee are beverages but all beverages are not tea and coffee. Option D expresses this relation correctly.

**The correct answer is D.**

**Directions for Questions 9–10:** Each question given below consists of a statement, followed by two arguments numbered I and II. You have to decide which of the arguments is a 'strong' argument.

Select from the following options:

- (A) Only argument I is strong  
 (B) Only argument II is strong  
 (C) Either argument I or II is strong  
 (D) Neither argument I nor II is strong  
 (E) Both arguments I and II are strong

9. **Statement:** Should diesel vehicles be banned from plying in Delhi?

**Argument I** Yes. This is very important to check the rising pollution levels in Delhi, since diesel vehicles are a major contributor to air pollution.

**Argument II** No. All essential commodities required by citizens of Delhi are transported by diesel vehicles, so banning these vehicles will lead to a rise in the price of such items.

Argument I gives a logical point in favour of the statement and Argument II makes an equally valid point against the statement. Thus, both the arguments are strong.

The correct answer is E.

10. **Statement:** Should international movies be banned from releasing in India?

**Argument I** Yes. Such movies destroy Indian culture by enticing the youth to follow an alien culture.

**Argument II** No. Most such movies have won international awards.

Argument I does not give a good enough reason for banning the movies. It is true that these movies depict an alien culture, but why will this destroy Indian culture? So, Argument I is weak. Argument II is also weak; just because a movie has won international awards is not a good enough reason to release it in India. Thus, both the arguments are weak.

The correct answer is D.

11. Study the matrices and determine the digits that comprise the given word.

	0	1	2	3	4
0	T	A	E	B	J
1	S	B	R	U	E
2	D	V	T	R	L
3	J	P	B	Y	S
4	N	I	J	U	E

	5	6	7	8	9
5	J	G	W	A	L
6	A	Z	K	F	E
7	J	B	I	T	I
8	P	U	P	U	N
9	L	A	G	C	T

**ABILANT**

- (A) 55, 86, 32, 41, 24, 01, 41, 99  
 (B) 40, 13, 76, 79, 24, 01, 40, 00  
 (C) 41, 13, 76, 14, 24, 01, 40, 00  
 (D) 75, 88, 76, 77, 59, 96, 88, 99  
 (E) 42, 13, 76, 79, 24, 01, 40, 00

42 - J, 13 - U, 76 - B, 79 - I, 24 - L, 01 - A, 40 - N, 00 - T

The correct answer is E.

12. A statement is followed by two conclusions, numbered I and II. On the basis of the information given in the statement, decide which of the conclusions can be drawn logically from the given statement.  
**Statement:** Canadian steel is harder than the steel produced in most other countries across the world.

**Conclusion I** Canadian steel manufacturers must be making a huge profit on their steel.

**Conclusion II** There is something about the manufacturing process employed by Canadian steel manufacturers that makes their steel harder.

- (A) Only Conclusion I follows.  
 (B) Only Conclusion II follows.  
 (C) Either Conclusion I or II follows.  
 (D) Neither Conclusion I nor II follows.  
 (E) Both Conclusions I and II follow.

The statement makes no mention of the selling price or profitability. It is possible that there is some other aspect of Canadian steel that dissuades people from using it. Then, these manufacturers will not be making huge profits. Thus, Conclusion I is not valid.

Again, we do not know whether it is something about the manufacturing process or whether it is something about the chemical composition of the raw materials used to make this steel that is responsible for this steel being harder. Thus, Conclusion II is also not valid.

The correct answer is D.

13. In the given question, there are five choices (A-E). Four of them are alike and one is different. Mark the one that is different.

- (A) Typhoon  
 (B) Volcano  
 (C) Storm  
 (D) Hurricane  
 (E) Cyclone

'Typhoon' refers to a tropical storm. 'Hurricane' refers to a storm with a violent wind, while 'Cyclone' is also a type of storm. Hence, 'Volcano' is the odd one out.

The correct answer is B.

14. **Statement:** All coolers are fans. Some fans are ACs. All ACs are irons. Some irons are blades.

**Conclusion I** Some fans are irons.

**Conclusion II** Some coolers are ACs.

**Conclusion III** Some blades are coolers.

**Conclusion IV** Some fans are blades.

- (A) Only I is correct  
 (B) I and II are correct  
 (C) I and III are correct  
 (D) II and IV are correct  
 (E) Only IV is correct



Since some fans are ACs and all ACs are irons, then some fans are definitely irons. Thus, Conclusion I is correct.

Since all fans may not be coolers, we cannot say for certain whether some coolers are ACs. Thus, Conclusion II is not correct.

There is no apparent connection between cooler and blades or between fans and blades. Thus, Conclusions III and IV are also not correct.

**The correct answer is A.**

15. If P is the brother of Q, B is the brother of Q and P is the brother of E, then which of the following statements is definitely true?

- (A) Q is the brother of B
- (B) Q is the brother of E
- (C) E is the brother of B
- (D) B is the brother of E
- (E) None of these

While we know that P, Q, B and E are siblings, we don't know the sex of E and Q. Thus, D is correct.

**The correct answer is D.**

**Question 16** consists of a statement followed by two decisions. You have to assume everything in the statement to be true and, on the basis of the information given in the statement, decide which of the suggested courses of action logically follow(s). Select from the following choices:

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

16. **Statement:** Vitamin D is vital for the human body. A lot of people take Vitamin D tablets, but these tablets are not as beneficial as taking in Vitamin D from natural sources.

**Decision I** The sale of Vitamin D tablets should be banned by the government.

**Decision II** People should be encouraged to consume food rich in Vitamin D such as fish, milk and so on.

There is no harm in taking Vitamin D tablets, so it does not make any sense banning them. Thus, Decision I is not a logical one. Decision II, on the other hand, makes complete sense.

**The correct answer is B.**

17. In the given question, there are five choices (A-E). Four of them are alike and one is different. Mark the one that is different.

- (A) 34
- (B) 102
- (C) 68
- (D) 51
- (E) 47

All are multiples of 17, except 47.

**The correct answer is E.**

18. Study the matrices and determine the digits that comprise the given word.

	0	1	2	3	4
0	R	A	E	B	N
1	S	C	R	M	E
2	D	V	T	R	V
3	T	P	F	Y	S
4	W	R	B	U	E

	5	6	7	8	9
5	T	G	L	R	W
6	A	Z	K	F	E
7	Y	L	I	G	I
8	P	S	P	T	L
9	L	X	G	C	P

#### RELEGATE

- (A) 12, 02, 76, 68, 78, 65, 22, 44
- (B) 23, 69, 89, 02, 56, 01, 98, 44
- (C) 00, 69, 89, 02, 56, 01, 55, 44
- (D) 41, 69, 57, 14, 97, 11, 22, 69
- (E) 00, 69, 89, 02, 56, 01, 55, 79

00 = R 69 = E 89 = L 02 = E 56 = G 01 = A 55 = T 44 = E

**The correct answer is C.**

**Directions for Questions 19-22:** Read the below information and answer the questions that follow.

"Four dogs F, G, H, J and two cats—K and M—will be assigned to exactly six cages numbered 1 to 6. Cage 1 faces Cage 4, Cage 2 faces Cage 5 and Cage 3 faces Cage 6.

The following conditions apply: The cats cannot face each other, else they'll start fighting. A dog must be put in Cage 1. H must be put in Cage 6. J must be put in a cage whose number is 1 more than the number of K's cage. K and H cannot be opposite each other."

19. Which one of the following must be true?

- (A) F is assigned to an even numbered cage.
- (B) F is assigned to Cage 1.
- (C) J is assigned to Cage 2 or Cage 3.
- (D) J is assigned to Cage 3 or Cage 4.
- (E) K is assigned to Cage 2 or Cage 4.

The final arrangement will look like this:

Possibility 1:

- 1 (dog) 2 (K-cat) 3 (J - dog)  
4 (M-cat) 5 (dog) 6 (H - dog)

Possibility 2:

- 1 (dog) 2 (M - cat/dog) 3 (M - cat/dog)  
4 (K-cat) 5 (J-dog) 6 (dog - H)

All the questions can now be easily answered.

The correct answer is E.

20. If J is assigned to Cage 3, which one of the following could be true?

- (A) F is assigned to Cage 2.  
(B) F is assigned to Cage 4.  
(C) G is assigned to Cage 1.  
(D) G is assigned to Cage 4.  
(E) M is assigned to Cage 5.

Check explanation to Question 19.

The correct answer is C.

21. Which one of the following must be true?

- (A) A cat is assigned to Cage 2.  
(B) A cat is assigned to Cage 5.  
(C) K's cage is in a different row from M's cage.  
(D) Each cat is assigned to an even-numbered cage.  
(E) Each dog is assigned to a cage that faces a cat's cage.

Check explanation to Question 19.

The correct answer is C.

22. If K's cage is in the same row as H's cage, which one of the following must be true?

- (A) F's cage is in the same row as J's cage.  
(B) F is assigned to a lower-numbered cage than G.  
(C) G is assigned to a lower-numbered cage than M.  
(D) G's cage faces H's cage.  
(E) M's cage is in the same row as G's cage.

Check explanation to Question 19.

The correct answer is E.

23. A statement is followed by two conclusions, numbered I and II. On the basis of the information given in the statement, decide which of the conclusions can be drawn logically from the given statement.

**Statement:** Should the Lokpal Bill be passed in the Parliament?

- Argument I** Yes. This is the only way to ensure a corruption-free country.  
**Argument II** No. It is impossible to make a country as large as India completely corruption free.  
**Argument III** Yes. It will help curb corruption by putting several checks and balances in place.  
**Argument IV** No. The Lokpal is already present in several states in India, but it has not proved to be particularly effective in curtailing corruption in those states.

- (A) Only II is strong  
(B) Only III is strong  
(C) Only IV is strong  
(D) Only I and IV are strong  
(E) Only III and IV are strong

The use of *only* in Argument I makes it weak, as there could be some other method as well by which India could be made free of corruption.

Argument II is again a weak argument, because it uses the word *impossible* without backing it up with any reasons.

Argument III gives a logical reason in support of the Lokpal and Argument IV gives an equally logical justification for why it may not be needed. Thus, both of these arguments are strong.

The correct answer is E.

24. **Statement:** Should the number of holidays for government employees in India be reduced?

- Argument I** Yes. No government employee in any other country gets as many holidays as a government employee does in India.  
**Argument II** Yes. This will help speed up work in government offices.  
**Argument III** No. Government employees should be treated at par with employees in the private sector who get fewer holidays.  
**Argument IV** No. The work done by government employees is extremely stressful, so they need extra holidays to unwind from this stress.

- (A) Only II and III are strong  
(B) Only III and IV are strong  
(C) Only II is strong  
(D) Only II, III and IV are strong  
(E) All are strong

What happens in other countries has no bearing on India, so Argument I is weak.

Argument II is strong, as it gives a direct benefit of the action mentioned in the statement.

Argument III is tricky. If government employees should be treated at par with employees in the corporate sector, then their holidays should actually be cut because private sector employees do not get so many holidays. Thus, Argument III is weak.

Argument IV is weak because giving extra holidays might actually increase this stress by piling up incomplete work.

**The correct answer is C.**

25. Given alongside is a statement followed by three arguments numbered I, II and III. Decide which of the given arguments is strong and is able to support the given statement. (*Real NMAT Question*)

**Statement:** It is good that the Central Board is switching its exam pattern to an Open-Book exam pattern like the other Boards in the country.

**Argument I** Yes, an Open-Book exam will test the higher-order thinking skills rather than test learning through rote or memorising.

**Argument II** No, exams have to be treated as exams—accessing books during the exams has long been considered an unhealthy practice.

**Argument III** Yes, an Open-Book exam simulates the real world. In our day-to-day existence, we have access to everything—what is important is whether we know when to access what.

- (A) Only Argument I is strong.
- (B) Only Argument II is strong.
- (C) Both I and II are strong arguments.
- (D) Both I and III are strong arguments.
- (E) Neither I nor II nor III is a strong argument.

Argument II does not directly support the given statement. The argument given is not strong enough.

Argument I gives a strong reason in support of the given statement as it states that we can check higher thinking skills by following the Open-Book system.

Argument III also gives a strong reason to support the given statement as it tries to create an analogy between exams and real world situations.

**The correct answer is D.**

26. A statement is followed by two conclusions, numbered I and II. On the basis of the information given in the statement, decide which of the

conclusions can be drawn logically from the given statement. (*Real NMAT Question*)

**Statements:** In the starry night that month, there were no scooters parked outside the mall.

**Conclusion I** People had gone to gaze at the stars.

**Conclusion II** Starry nights were rare.

- (A) Only Conclusion I follows.
- (B) Only Conclusion II follows.
- (C) Both Conclusions I and II follow.
- (D) Either Conclusion I or II follows.
- (E) Neither Conclusion I or II follows.

Neither of the conclusions can be drawn from the given statement. The fact that scooters were not parked outside the mall does not indicate that they had gone to gaze at stars instead. It is not clear how many starry nights there are. So neither conclusion can be made.

**The correct answer is E.**

27. In a certain code language, if the word 'HOLMES' is coded as 'PINMTF', then how will 'CREATE' be coded? (*Real NMAT Question*)

- (A) SDBFFU
- (B) RCAEET
- (C) SDAEFU
- (D) RCBFFU
- (E) SDBGGU

Each pair in the word is swapped; thus, HO is swapped and becomes OH, LM is swapped to become ML, and ES is swapped to become SE. The word HOLMES thus becomes OHMLSE. Next, the immediate next letter for each of the letters in the newly formed term is written; thus, OHMLSE becomes PINMTF.

Similarly, CREATE is first written as RCAEET and then coded as, SDBFFU.

**The correct answer is A.**

28. Select a code for 'PROFIT', which follows the same code as 'COMMON'. (*Real NMAT Question*)

- (A) MOLDFQ
- (B) RUSKOA
- (C) RUSLOA
- (D) SUQTIF
- (E) RFIRFI

The term PROFIT is coded per the last code depicted in the direction statement. In other words, as COMMON is to ERQRUU (where each subsequent letter in the term moves up by +1). For example, the letter C is coded as E leaving out one letter F, the next letter O is coded as R leaving out two letters P and Q and so on.

Similarly, PROFIT is coded as RUSKOA.

The correct answer is B.

29. The code for the word RAMSHACKLE in a certain language is 23 - 6 - 18 - 24 - 13 - 6 - 8 - 16 - 17 - 10. What will be the code for the word ONEROUS in that language? (**Real NMAT Question**)

- (A) 22 - 5 - 6 - 9 - 10 - 20 - 25  
(B) 7 - 23 - 21 - 15 - 19 - 10 - 2  
(C) 15 - 14 - 5 - 18 - 15 - 21 - 19  
(D) 20 - 19 - 10 - 23 - 20 - 26 - 24  
(E) 26 - 12 - 16 - 16 - 10 - 14 - 18

The code is the actual position of the letter in the English alphabet + 5. Thus, A (whose position in the English alphabet is 1) is being coded as  $1 + 5 = 6$ . R (whose position in the English alphabet is 18) is being coded as 23 and so on.

Thus, ONEROUS would be coded as  $(15 + 5)$ ;  $(14 + 5)$ ;  $(5 + 5)$ ;  $(18 + 5)$ ;  $(15 + 5)$ ;  $(21 + 5)$ ;  $(19 + 5)$

The correct answer is D.

Directions for Questions 30-33: Read the below information and answer the questions that follow.

Eight friends N, L, M, R, P, Y, T and Q are sitting around a circular desk facing away from the centre. Each friend has a different car—Lambretta, VW, Lycan, Creta, Ariel, Garmin, Punto and Scorpio, but not necessarily in that order. T is sitting third to the right of P. The one who owns Lambretta is second to the left of the one who owns Lycan. Y owns Lycan and is sitting exactly between P and L. The one who owns Punto is sitting second to the right of N. The one who owns Ariel is second to the right of the person who owns Garmin. P sits third to the left of the person who owns VW. Neither Q nor L is the immediate neighbour of N. Q is fourth to the left of L. N does not own Creta or Ariel. The person who owns Lambretta is sitting second to the right of the person who owns Creta. R owns Lambretta and he is not an immediate neighbour of N.

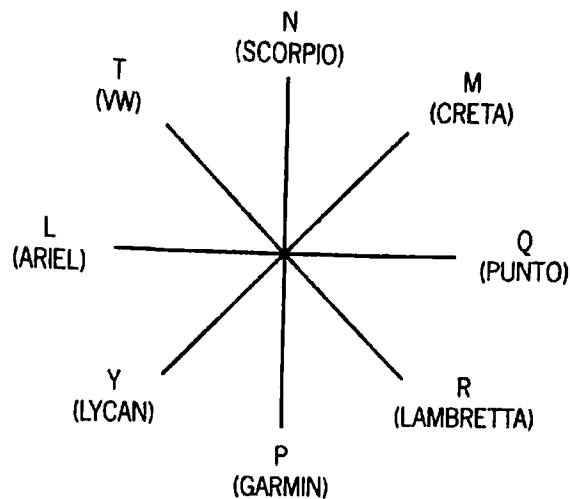
30. Who sits fourth to the right of L?

- (A) P  
(B) Y

- (C) R  
(D) Q  
(E) None of these

We need to arrange 8 people in a circular arrangement (facing away the Centre). We should start by fixing the position of Y (as a lot of the given information is about Y or related to Y).

The final arrangement will look as follows:



All the questions can now be easily answered.

The correct answer is D.

31. Which of the following cars does N own?

- (A) Punto  
(B) Scorpio  
(C) Garmin  
(D) VW  
(E) Lycan

Check explanation for Question 30.

The correct answer is B.

32. What is P's position with respect to Q?

- (A) Third to the left  
(B) Fifth to the left  
(C) Second to the right  
(D) Third to the right  
(E) Fourth to the left

Check explanation for Question 30.

The correct answer is C.

33. Which of the following combinations is correct?

- (A) R - Garmin
- (B) Y - Creta
- (C) N - Scorpio
- (D) T - Ariel
- (E) All are true

Check explanation for Question 30.

**The correct answer is C**

**Questions 34–36** contain two statements that are followed by two conclusions. You need to decide which of the given conclusions logically follows from the statements, disregarding commonly known facts. Select your choices from the following options:

- (A) Only Conclusion I follows
- (B) Only Conclusion II follows
- (C) Either Conclusion I or II follows
- (D) Neither Conclusion I nor II follows
- (E) Both Conclusions I and II follow

- 34. Statements:** All chairs are pins. Some pins are sofas.

**Conclusion I** Some sofas are chairs.

**Conclusion II** Some sofas are not pins.

All chairs are pins, but this does not mean that all pins are chairs. There could be some pins that are not chairs. Hence, though the second statement says that some pins are sofas, we don't know whether these are the same pins that are also chairs. So we cannot say for sure that some sofas are chairs. Thus, Conclusion I cannot be concluded.

From the statement—some pins are sofas—we can infer that some pins are not sofas. However, we cannot infer that some sofas are not pins because it is possible that all sofas could be pins. Thus, Conclusion II cannot be concluded.

**The correct answer is D.**

- 35. Statements:** All stones are chisels. No chisel is a pen.

**Conclusion I** Some stones are pens.

**Conclusion II** No pen is a stone.

If no chisel is a pen, it means that no stone is a pen. Thus, Conclusion I is incorrect and II is correct.

**The correct answer is B.**

- 36. Statements:** Some trees are green. All green are not blue.

**Conclusion I** Some trees are not green.

**Conclusion II** Some trees are not blue.

If some trees are green, we can easily infer that some trees are not green. Thus Conclusion I is valid. Similarly, if all green are not blue, then the trees which are green are not blue. Thus, Conclusion II is also valid.

**The correct answer is E.**

**Questions 37–43** consist of a statement followed by two assumptions. Consider the statement and the two assumptions and decide which of the assumptions is implicit in the statement. Select from the following options:

- (A) Only I is an assumption
- (B) Only II is an assumption
- (C) Either I or II is an assumption
- (D) Neither I nor II is an assumption
- (E) Both I and II are assumptions

- 37. Statement:** Of late, incidents of food poisoning caused by the consumption of grains mixed with impurities have been taking place in rural areas.

**Assumption I** There are many shops selling grains mixed with impurities in rural areas.

**Assumption II** The percentage of people consuming grains is higher in rural areas.

Assumption I is definitely implicit since impure grain must be easily available in rural areas. Assumption II is not implicit since we cannot infer anything about the percentage of people consuming this grain.

**The correct answer is A.**

- 38. Statement:** The bank's recent investment in an e-commerce start-up is a total gamble.

**Assumption I** The bank may lose its investment.

**Assumption II** It is not sufficiently clear whether the venture will succeed.

Since the investment is a gamble, it may or may not succeed. From this, both Assumptions I and II can be implied. Thus, both Assumptions I and II are valid assumptions.

**The correct answer is E.**

- 39. Statement:** The government has decided to levy a 2% education cess to fund education programmes across India.

**Assumption I** The government currently does not have sufficient money to fund these education programs.

**Assumption II** The people of India want to contribute towards setting up these education programs.

If the government had funds, why would it levy this cess in the first place? Thus, Assumption I is implicit in the statement. What the people of India want or do not want cannot in any way be implied from the statement. Thus, Assumption II is not a valid assumption.

The correct answer is A.

40. **Statement:** Children less than five years of age need to be continually kept mentally stimulated.

**Assumption I** A large part of the development of intelligence and other social skills takes place in the early years of a child.

**Assumption II** 40 percent of a person's intelligence at the age of 22 can be predicted by the age of five.

Assumption I is definitely implicit in the statement since it is the reason for keeping children mentally stimulated. Assumption II is not implied since we do not know anything about the prediction of intelligence.

The correct answer is A.

41. **Statement:** Rahul has spent several hours every day preparing for the upcoming national entrance test, but he is still not sure how he will perform in it.

**Assumption I** Rahul may perform well in the test.

**Assumption II** The test is a very difficult one.

From the given statement, it clearly follows that Rahul may or may not perform well in the test. Thus, Assumption I is implicit. We cannot imply anything about the difficulty level of the test from the statement. Thus, Assumption II is not implicit.

The correct answer is A.

42. **Statement:** The manager of the hotel instructed his staff to provide dinner to all the guests.

**Assumption I** Had the manager not instructed, dinner may not have been served to all the guests at the hotel.

**Assumption II** The guests will be in the hotel at dinner time.

Both assumptions can be implied from the given statement, making the answer (E).

The correct answer is E.

43. **Statement:** Sign posted on a lift—Please do not use lift in case of fire.

**Assumption I** In case of fire, the lift will stop functioning.

**Assumption II** In case of fire, there is a high probability that the lift will fall down.

**Assumption III** People may be endangering their lives if they use the lift in case of a fire.

- (A) Only I is implicit
- (B) Only III is implicit
- (C) Only I and II are implicit
- (D) All are implicit
- (E) None are implicit

From the given statement, it is implied that it is dangerous to use the lift in case of a fire, which is why people are being asked to avoid it. However, we have no idea what this danger is—whether the lift will stop functioning or it will fall down or something else. All we know is that it is dangerous. Thus, Assumption III is the only assumption that is implicit in the statement.

The correct answer is B.

44. Rajeev is the brother of Rishi. Karuna is the sister of Ajay. Rishi is the son of Karuna. How is Rajeev related to Ajay?

- (A) Son
- (B) Brother
- (C) Nephew
- (D) Father
- (E) Uncle

Rajeev and Rishi are brothers. Karuna is Rishi's mother and so she is also Rajeev's mother. As Ajay is Karuna's brother, he is also the maternal uncle of Rajeev. Therefore, Rajeev is Ajay's nephew. Hence, option C is correct.

The correct answer is C.

45. Ajay and Binod are brothers and Chaitali and Dhvani are sisters. Ajay's son is Dhvani's brother. How is Binod related to Chaitali?

- (A) Grandfather
- (B) Brother
- (C) Son
- (D) Uncle
- (E) Father

If Ajay's son is Dhvani's brother, then Dhvani is Ajay's daughter. So, Chaitali is also Ajay's daughter. This makes Binod Chaitali's uncle.

**The correct answer is D.**

- 46. Statement:** You will never know how big a bookstore can be unless you enter the Delhi Book Store.  
(Real NMAT Question)

**Assumption I** The Delhi Book Store has the greatest number of books.

**Assumption II** You cannot imagine a book store as big as the Delhi Book Store.

- (A) Only I is an assumption
- (B) Only II is an assumption
- (C) Both I and II are assumptions
- (D) Either I or II is an assumption
- (E) Neither I nor II is an assumption

Even if true, the two statements are conclusive statements rather than assumptions. So, E is the correct answer.

**The correct answer is E.**

- 47.** Pointing to Akshay, Rahul said, 'I am the only son of one of the sons of his father.' How is Akshay related to Rahul?

- (A) Nephew
- (B) Uncle
- (C) Father or Uncle
- (D) Father
- (E) Brother or Nephew

Akshay's father's son will either be Akshay himself or Akshay's brother. Thus, Rahul will be either Akshay's son or the son of Akshay's brother.

**The correct answer is C.**

- 48.** In a certain code, DONKEY is written as XDJMNC. How is LION written in that code?

- (A) MNHK
- (B) BHUP
- (C) VGSW
- (D) LDRE
- (E) IYUO

The code is created in this manner: write DONKEY in reverse and move back each letter by one step.

$Y - 1 = X$

$E - 1 = D$

$K - 1 = J$

$N - 1 = M$

$O - 1 = N$

$D - 1 = C$

Thus, LION will be written as MNHK.

**The correct answer is A.**

- 49.** For the past two decades, Eton Coaching Institute has been the market leader in preparing students for the entrance test to medical schools in the country. While several new players have set up shop in the last few years, and have shown good results, it remains without doubt that if a student wishes to pass the medical school entrance test, his best chances are with Eton Coaching Institute.

The statements above, if true, best support which of the following assertions?

- (A) There is something unique about the books provided by the Eton Coaching Institute that makes its students perform very well in the medical school entrance test.
- (B) If a student does not join the Eton Coaching Institute, he will most likely fail the medical school entrance test.
- (C) The teachers at Eton Coaching Institute are probably better than those at other institutes.
- (D) A student could clear the medical school entrance test, even if he hasn't studied at the Eton Coaching Institute.
- (E) If a student has studied at the Eton Coaching Institute, he will clear the medical school entrance test.

Since this is an inference question, we need to go through each option one by one.

- (A) Not necessarily. The books provided by Eton could very well be the same as those provided by other institutes; maybe it's the teachers at Eton who are unique.
- (B) Extreme inference. The argument never states anything about the chances of a student clearing the medical entrance test. Maybe for other institutes the chances are 2% and for Eton the chances are 10% but even then 90 out of 100 students enrolled at Eton (and 98 of the 100 enrolled at other institutes) will not clear the test.
- (C) This is the opposite of A. It could very well be that the books at Eton are better and the teachers are not.
- (D) The correct answer. The argument never states that a student's only chance of clearing the test is with Eton but that his best chances are with Eton.

It is very much possible that a student enrolls with some other institute (or doesn't enrol at all) and yet manages to clear the test.

- (E) Same as (B).

The correct answer is D.

50. In a code language, 'The day looks sunny' is written as 'dim may zook manny'

'Thursday was a sunny day' is written as 'bekbay il po manny may'

'Sunny days are here again' is written as 'manny kil lop pere jukol'

What is the code for 'sunny'?

- (A) zook  
(B) may  
(C) dim  
(D) manny  
(E) bekbay

Between the first two sentences, the only common words are sunny and day and the only common codes are 'manny' and 'may'. Thus, one of these must mean sunny. Sentence 3 includes sunny but not day and it includes the code manny but not may. Thus, the code for sunny must be manny.

The correct answer is D.

Questions 51-53 consist of a statement followed by two/three assumptions. Consider the statement and the assumptions and decide which of the assumptions is implicit in the statement.

51. **Statement:** The government has issued a diktat to all farmers to cut down on their use of pesticides as it may end up polluting the ground water.

**Assumption I** At least, some farmers currently use more pesticide than is needed.

**Assumption II** Farmers will be able to cut down on the use of pesticides without it making any significant difference to their production.

**Assumption III** Pollution of ground water may lead to adverse effects.

- (A) Only I is implicit  
(B) Only III is implicit  
(C) Only II and III are implicit  
(D) Only I and III are implicit  
(E) All are implicit

If the government is asking the farmers to cut down on their use of pesticides, then it obviously

thinks that there are at least some farmers who are currently using more pesticides than is necessary. Thus, Assumption I is implicit. Again, the government will not do anything to damage the position of the farmers, so it must be thinking that even if the farmers cut down on their pesticide use, they will still be able to produce the same amount of crop as earlier. Thus, Assumption II is also implicit. Assumption III also has to be implicit as this is why the government has issued the diktat in the first place. Thus, all three assumptions are implicit in the statement.

The correct answer is E.

52. **Statement:** The Apogee Laptop Company has decided to increase the price of its laptops by 25 percent with immediate effect.

**Assumption I** Other laptop manufacturers will also soon raise the prices of their respective laptops since Apogee is the market leader.

**Assumption II** The Apogee Company does not expect the demand for its laptops to go down considerably after this hike.

- (A) Only I is implicit  
(B) Only II is implicit  
(C) Either I or II is implicit  
(D) Neither I nor II is implicit  
(E) Both I and II are implicit

Assumption II is implicit because if the Apogee Company felt that the demand would go down after the price hike, it would not have implemented the price hike in the first place. Assumption I on the other hand may or may not be true.

The correct answer is B.

53. **Statement:** A newspaper has claimed in its new advertisement that it has dedicated half its pages to the sports section.

**Assumption I** Most of the newspaper's readers are current or past sportspeople.

**Assumption II** People who form the target market of this newspaper are very interested in sports-related news items.

**Assumption III** Other newspapers most likely have a smaller proportion of their pages dedicated to the sports section.

- (A) Only I is implicit  
(B) Only II is implicit



- (C) Only I and III are implicit
- (D) Only II and III are implicit
- (E) None are implicit

There is no logic behind concluding that it is only sportspeople who read sports-related news items. Thus, Assumption I is not implicit. If the newspaper is using this fact in its advertisement, then it must feel that its target market will be interested in sports-related news. Thus, Assumption II is implicit. Assumption III is also implicit because if all the newspapers had the same proportion of their pages dedicated to sports news, then what is the point of highlighting this fact in an advertisement as a differentiating factor?

**The correct answer is D.**

54. In a certain code, TRIFLE is written as FERTIL. How is JASPER written in that code?

- (A) ASEJRP
- (B) APJRES
- (C) PRAJSE
- (D) SEJPAR
- (E) PERSAJ

Notice that this is a jumbled type code, since all the letters in the original word and the code are the same. Thus, you simply need to make the same changes to the placement of the letters in the given word as have been made to TRIFLE.

**The correct answer is C.**

55. Forty six boys are standing in a row facing north. Raj is 14<sup>th</sup> from the left and Vikram is 29<sup>th</sup> from the right end of the row. How far away will Uday be from Vikram if he is standing eight places to the right of Raj? (*Real NMAT Question*)

- (A) One place
- (B) Two places
- (C) Three places
- (D) Four places
- (E) Five places

Raj and Vikram are standing 4 places away. 29<sup>th</sup> from right would be 18<sup>th</sup> from left, and Raj is 14<sup>th</sup> from left. If Uday is eight places to the right of Raj, then he is four places away from Vikram.

**The correct answer is D.**

56. Kiran ranks 18<sup>th</sup> from the top and 23<sup>rd</sup> from the bottom in an examination. How many students are there in the class? (*Real NMAT Question*)

- (A) 38
- (B) 39
- (C) 40
- (D) 41
- (E) 42

If Kiran is in the 18<sup>th</sup> position from the top, and 23<sup>rd</sup> from the bottom, it would mean that there are 22 more students after the 18<sup>th</sup> position. So,  $18 + 22 = 40$ .

**The correct answer is C.**

57. In a certain code language, if RAHUL is coded as SBIVM, how is ANMOL coded in that same language? (*Real NMAT Question*)

- (A) BONRM
- (B) BONPM
- (C) BONQM
- (D) BONSM
- (E) BORNM

For each letter in the word, the immediate next letter is taken in the code. Thus for R, A, H, U, and L, the immediate next higher letters are being taken...R is S, A is B, H is I, U is V and L is M. Thus, R, A, H, U, L is coded as S, B, I, V, M.

Similarly, ANMOL will be coded as BONPM.

**The correct answer is B.**

58. Each of the vowels in the word 'COMPLEX' is replaced by the number '3' and each consonant is replaced by a number which is the position of that consonant in the word, that is, C by 1, M by 3 and so on. What is the total of all the numbers once the replacement is complete? (*Real NMAT Question*)

- (A) 22
- (B) 23
- (C) 24
- (D) 25
- (E) None of the above

Given the numbering logic in the question, COMPLEX = 1334537. Adding the digits will give 26, which is not among the options, making E the correct answer.

**The correct answer is E.**

59. What should be the next term in the series 22, 31, 40, 49, 58, \_\_\_\_\_?

- (A) 67
- (B) 68

- (C) 71  
(D) 73  
(E) 77

This is simple arithmetic progression, in which you keep adding 9 to the previous number to get to the next number. So, the next number should be  $58 + 9 = 67$ .

The correct answer is A.

60. What number should come next in the following series?

5, 7, 12, 19, 31, 50,

- (A) 63  
(B) 76  
(C) 81  
(D) 86  
(E) 91

This is a Fibonacci sequence in which the sum of a term is equal to the sum of the previous two terms. Thus, the required term =  $31 + 50 = 81$ .

The correct answer is C.

Directions for Questions 61–64: A word and number arrangement machine when given an input line of words and numbers rearranges them following a particular rule at each step. The following is an illustration of input and arrangement.

Input: gas net 54 36 17 fan act 65

Step 1: 65 gas net 54 36 17 fan act

Step 2: 65 act gas net 54 36 17 fan

Step 3: 65 act 54 gas net 36 17 fan

Step 4: 65 act 54 fan gas net 36 17

Step 5: 65 act 54 fan 36 gas net 17

Step 6: 65 act 54 fan 36 gas net 17

Step 7: 65 act 54 fan 36 gas 17 net

61. What will be step 3 for the following input?

can axe 32 12 kit 57 bat 89

- (A) 89 axe 57 bat 32 can 12 kit  
(B) 89 axe 57 bat can 32 12 kit  
(C) 89 axe can 32 12 kit 57 bat  
(D) 89 axe 57 can 32 12 kit bat  
(E) 89 can axe 32 12 kit 57 bat

In the given example, note that in every step, the words get arranged alphabetically from left to right and the numbers get arranged in descending order.

The words and numbers also alternate with the numbers occupying the first slot. Using this logic:

Input: can axe 32 12 kit 57 bat 89

Step 1: 89 can axe 32 12 kit 57 bat

Step 2: 89 axe can 32 12 kit 57 bat

Step 3: 89 axe 57 can 32 12 kit bat

The correct answer is D.

62. How many steps will be needed to complete the following arrangement?

76 cot 64 dog 45 hen 54 urn

- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5

Input: 76 cot 64 dog 45 hen 54 urn

Next Step: 76 cot 64 dog 54 hen 45 urn

Next + 1 step: 76 cot 64 dog 54 hen 45 urn

Thus, 2 more steps are needed to complete the arrangement

The correct answer is B.

63. If step 3 of an input is as given below, which of the following must have definitely been the input?

76 gap 56 ink 14 leg 22 oxe

- (A) oxe 56 ink 56 leg 22 gap 76  
(B) 56 ink 56 leg 22 gap 76 oxe  
(C) 56 76 ink oxe 56 leg 22 gap  
(D) 22 gap 76 oxe 56 ink 56 leg  
(E) Cannot be determined

Note that we can never arrive at an input from a given output because there exist multiple possibilities for the input.

The correct answer is E.

64. What will be last step for the following input?

tie 56 mat 99 pot 33 jut 22

- (A) jut 99 mat 56 pot 33 tie 22  
(B) 99 jut 56 pot 33 mat 22 tie  
(C) 99 tie 56 pot 33 mat 22 jut  
(D) 99 jut 56 mat 33 pot 22 tie  
(E) 22 jut 33 mat 56 pot 99 tie

Note that to get the last step, that is the final output, we don't need to go through all the steps. We can

simply arrange the given terms in alphabetical order (for the words) and descending order (for the numbers) – 99 jut 56 mat 33 pot 22 tie.

**The correct answer is D.**

65. One evening Suresh and Ramesh were talking to each other and Suresh's shadow fell behind Ramesh. Which direction was Ramesh facing?

(A) East  
(B) West  
(C) North-west  
(D) South  
(E) North

If you remember the rules about shadows, you will recall that if the shadow falls behind you in the evening, you are facing west. You can even verify this pictorially, in case you have forgotten the rules.

**The correct answer is B.**

Questions 66–69 consist of a statement followed by two conclusions. Assume everything in the given statement to be true, and then decide which of the two conclusions logically follow from this statement. Select your answer from the following choices:

- (A) Only Conclusion I follows  
(B) Only Conclusion II follows  
(C) Either I or II follows  
(D) Neither I nor II follows  
(E) Both I and II follow

66. **Statement:** In a football match, three of the goals scored by the winning team were scored by defenders and not by strikers.

**Conclusion I** The winning team has better defenders than it has strikers.

**Conclusion II** Had the winning team's defenders not scored those goals, the team would have lost the match.

We have no idea how the defenders managed to score those goals. Maybe the ball was passed to them by the strikers, who did all the hard work in getting the ball close to the opponent's goal post. Thus, Conclusion I cannot be concluded. Conclusion II is an extreme option as there is nothing in the statement to suggest such an eventuality. Thus, neither of the two conclusions can be concluded from the given statement.

**The correct answer is D.**

67. **Statement:** The government of the Maldives has recently announced various discounted package tours for tourists visiting the Maldives.

**Conclusion I** The government of the Maldives wants more foreign tourists to visit the Maldives.

**Conclusion II** There has been a decline in the number of tourists visiting the Maldives in recent years.

If the government of the Maldives is offering these discounted packages, then it definitely wants more tourists to visit the Maldives. So, Conclusion I can be concluded. However, it is not necessary that there has been a decline in the number of tourists visiting the Maldives in recent years. This number may even have grown, for all we know, and the government of the Maldives may want it to grow even more. Thus, Conclusion II cannot be concluded.

**The correct answer is A.**

68. **Statement:** Money plays a vital role in business.

**Conclusion I** Poor people can never become successful businessmen.

**Conclusion II** All rich people own businesses.

Both the given inferences are extreme and neither of them can be arrived at from the given statement. Thus, neither of the two conclusions is a valid inference.

**The correct answer is D.**

69. **Statement:** It is the dream of every Indian student to study at Harvard University, which has only 900 seats.

**Conclusion I** Some of the students will not be able to achieve their dream of studying at Harvard University.

**Conclusion II** Harvard University is the highest ranked university in the world.

It is not possible for every Indian student to get into Harvard University. Thus, some will end up not achieving this dream. Thus, Conclusion I can be inferred. The fact that all students want to study at Harvard University does not have anything to do with its placement on the rankings chart. Thus, Conclusion II cannot be inferred.

**The correct answer is A.**

70. A popular talk show host has been regularly making fun of a new movie on his programme for the past few days. The director of the movie attributes the poor performance of the movie to this fact.

Which of the following options most seriously weakens the above argument?

- (A) Several other film makers have also accused the talk show host of talking poorly about their movies.
- (B) There has been no change in the ticket prices at movie theatres in the past few months.
- (C) The talk show host has also made fun of several other movies and TV programmes on his talk show during this period.
- (D) The talk show host makes fun of only those movies that perform poorly at the box office.
- (E) The movie has been criticised by some sections of the media too for being overly long and having a clichéd storyline.

The argument concludes that the poor performance of the movie can be attributed to the talk show host making fun of it. Option D reverses this logic by stating that it is because the movie was performing badly that the talk show host was making fun of it. Thus, the talk show host could not be responsible for the failure of the movie.

The correct answer is D.

71. If it is possible to make only one meaningful word with the second, fourth, sixth and ninth letters of the word 'GOVERNMENT' using each only once, which of the following will be the third letter of that word? If no such word can be formed, give 'X' as the answer and if more than one such word can be formed, give 'Y' as the answer. (Real NMAT Question)

- (A) O
- (B) E
- (C) X
- (D) N
- (E) Y

The second, fourth, sixth and ninth letters in the word, GOVERNMENT are: OENNN.

Using each of these four letters, one can form NONE and NEON. Therefore, Y is the correct answer.

The correct answer is E.

72. In a recently conducted survey on the quality of life among the citizens of a city, surveyors spoke to 980 citizens, a majority of whom said that they were satisfied with their quality of life. Thus, it can be concluded that the citizens of this city are satisfied with their quality of life.

Which of the following options most seriously weakens the above argument?

- (A) The surveyors spoke to people from only a particular economic strata.
- (B) Some of the respondents said that they were extremely dissatisfied with their quality of life.
- (C) The survey results are different from what have been reported from other neighbouring cities.
- (D) The survey sample was representative of the entire population of the city.
- (E) The governing body of the city is not very different from the governing bodies of other neighbouring cities.

The argument assumes that the sample of 980 people is representative of the entire population of the city. Option A raises doubts about this and should be the correct answer.

The correct answer is A.

73. **Statement:** Most of the items available at malls are expensive.

**Conclusion I** Some items available at malls may not be expensive.

**Conclusion II** There are no cheap items available at malls.

**Conclusion III** The quality of products available at malls is better.

**Conclusion IV** The stores at malls cheat customers.

- (A) Only I can be inferred
- (B) Only III can be inferred
- (C) Only I and III can be inferred
- (D) Only II, III and IV can be inferred
- (E) All can be inferred

The statement says that most of the items (but not all items) available at malls are expensive. This means that some of the items available at malls may not be expensive. Thus, Conclusion I is a valid inference. From this fact, Conclusion II cannot be inferred as it is extreme. We cannot infer anything about the quality of the products from the given statement (remember to avoid using your knowledge while answering inference questions). Conclusion IV is also an extreme inference. Thus, only Conclusion I is correct.

The correct answer is A.

74. Scientists have discovered that manganese containing Element Z is stronger and more flexible than ordinary manganese because Element Z reduces the problem of small breakages. The level of Element Z in much of the manganese produced in Australia is naturally high because of the natural topography of the region.

Which of the following can be correctly inferred from the statements above?

- (A) Manganese produced from Australian ore deposits contains the highest levels of Element Z found in any manganese.
- (B) Manganese from Australia is stronger and more flexible than manganese from any other country.
- (C) Manganese that is not from Australia is very likely to encounter the problem of small breakages.
- (D) Producing manganese from ore deposits containing Element Z is the best way to make manganese that is strong.
- (E) Some manganese produced in Australia is less likely to develop small breakages than other manganese.

Remember to avoid extreme options in Inference questions. Options A, B, C and D all make extreme inferences. Option E is the only one that makes a reasonable inference and should be the correct answer.

**The correct answer is E.**

75. **Statement:** A few businessmen and all the politicians involved in the 2G scam were arrested last week. Ajay and Virendra were among those arrested.

**Conclusion I** Ajay and Virendra are politicians.

**Conclusion II** Ajay and Virendra are businessmen.

**Conclusion III** Ajay and Virendra are involved in the 2G scam.

**Conclusion IV** Ajay and Virendra are either politicians or businessmen.

- (A) Only I can be inferred
- (B) Only III can be inferred
- (C) Only IV can be inferred
- (D) Only I and III can be inferred
- (E) Only III and IV can be inferred

If Ajay and Virendra were arrested, they are definitely either politicians or businessmen (but we do not know which). Hence, Conclusions I and II are incorrect and Conclusion IV is correct. Conclusion III obviously has to be correct. Thus, Conclusions III and IV are valid inferences.

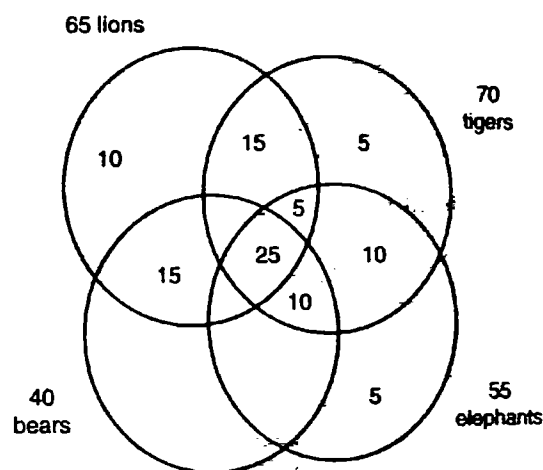
**The correct answer is E.**

76. 65% of all circus units in Country X have lions, 70% have tigers, 55% have elephants and 40% have bears. At least what percentage of circus units in Country X have all four animals in their team if it is

also known that the percentage of only lions and tigers (both) in the units is 15; the percentage of only lions and bears (both) in the units is also 15; the percentage of only tigers and elephants (both) in the units is 10; that of only lions, tigers and elephants (all three) in the units is 5 and the percentage of tigers, elephants and bears is 10? Assume that there are no other combination of animals in the circus units.  
**(Real NMAT Question)**

- (A) 5
- (B) 10
- (C) 15
- (D) 25
- (E) 35

Let us represent the given information in the form of a Venn diagram as below,



**The correct answer is D.**

77. An international mining company came up with an idea to extract precious metals in space from the asteroids and meteoroids approaching close to Earth. A metallurgical engineer appealed to the international space regulatory agency against allowing this company to extract from any alien body.  
**(Real NMAT Question)**

Which of the statements, if true, would most severely strengthen the appeal of the metallurgical engineer?

- (A) Space mining is very expensive and the money should be used for the betterment of the poor people on Earth.
- (B) Many areas on Earth have not yet been explored for mining which might have huge deposits of precious metals.
- (C) No significant material has been reported from any asteroid or meteoroid study, so it could be a worthless project.

- (D) Scientists should look for opportunities to explore new and alternative options to benefit human life within planet Earth.
- (E) The asteroids and meteoroids are known to contain hazardous materials, which if brought to Earth could cause serious ecological problems.

Option E would most severely strengthen the appeal of the metallurgical engineer—not only does it highlight why this project will not be of any use (which Option C does as well), additionally it also alerts to the risks associated with this project. Options A, B and D are opinions, and thus, the other options would not have as much of an impact.

The correct answer is E.

78. Suppose that the symbols @, #, and \$ were defined in reference to a set to imply the following,  
(Real NMAT Question)

@ (P, Q) = H.C.F. of P and Q

# (P, Q) = L.C.M. of P and Q

\$ (P, Q) =  $P \times Q$

What would you conclude from \$ (@ {12, 18}, # {12, 18})?

- (A) \$ {6, 36}
- (B) # {12, 18}
- (C) \$ {12, 18}
- (D) @ {36, 6}
- (E) None of the above

\$ (@ {12, 18}, # {12, 18})

One could conclude from the information in the question that the above would mean:

(HCF of 12 and 18) to be multiplied with (LCM of 12 and 18)

or \$ {6, 36}

The correct answer is A.

79. There are two ways of successfully completing a marathon—practise running for 4 hours every day or make changes to your diet so that you are consuming more high energy foods. Research has clearly proved that practising running is far more effective than making changes to your diet, as far as competing in a marathon is concerned. Thus, if a person consistently runs for at least 4 hours every day, he is doing the most that can be done to perform well in the marathon.

Which of the following options, if true, most seriously weakens the above argument?

- (A) Some experienced marathon runners believe that diet plays a more important role in their performance than exercise or running.
- (B) The performance in the marathon can be improved further by employing both the strategies together.
- (C) Everyone who competes in a marathon does not necessarily do so for the purpose of winning it, but for its health benefits.
- (D) One of the most important aspects of performing well in a marathon is the ability to manage your pace.
- (E) A marathon is as much a test of endurance as it is of speed.

The argument assumes that only one of the two strategies—running and diet—can be applied by a person. But what if applying both the strategies can lead to even better gains in marathon performance? Then the argument would be weakened, making B the answer.

The correct answer is B.

80. Given alongside is a statement followed by two assumptions numbered I and II. An assumption is something supposed or taken for granted. You have to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement. (Real NMAT Question)

**Statement:** Each and every citizen should be completely dedicated to his/her motherland; otherwise, his/her citizenship should be rejected.

**Assumption I** It is possible to know whether a citizen is dedicated to his motherland or not.

**Assumption II** If one's citizenship is rejected, it should not be seen as punishment.

- (A) Only Assumption I is implicit.
- (B) Only Assumption II is implicit.
- (C) Either Assumption I or II is implicit.
- (D) Neither Assumption I nor II is implicit.
- (E) Both Assumptions I and II are implicit.

Assumption II is not implicit in the statement as it is not clear that having citizenship rejected is actually a punishment. However, it should be possible to know whether a citizen is dedicated to the motherland by the fact that he or she has a citizenship.

The correct answer is A.

Questions 81–82 consist of a statement followed by two assumptions. You have to consider the statement and the two assumptions and decide which of the assumptions is implicit in the statement. Select from the following options:

- (A) Only I is implicit
- (B) Only II is implicit
- (C) Either I or II is implicit
- (D) Neither I nor II is implicit
- (E) Both I and II are implicit

**81. Statement:** Suresh has applied for a loan of Rs. 60000 from his bank to pay for his son's educational expenses.

**Assumption I** The bank will reject the loan because it has a policy of not awarding loans for education purpose.

**Assumption II** Suresh has failed to arrange for the money from all other sources available to him.

Assumption I is not implicit since we have no idea how the bank will respond. Assumption II is not implicit because we do not know whether Suresh has approached other people for this loan.

**The correct answer is D.**

**82. Statement:** Until the release of this book, such a lucidly written book was not available on this subject.

**Assumption I** There are other books available on this subject.

**Assumption II** For a book to sell well, it is very important that it be lucidly written.

From the statement, it is clear that there were books available on this subject, but that they were not as crisply written as the current book. So, Assumption I is implicit.

The statement never goes into what are the prerequisites for a book to sell well. So, Assumption II is not implicit.

**The correct answer is A.**

**83. Fill in the blank in the series:**  
**(Real NMAT Question)**

132, 182, 306, \_\_, 552;

- (A) 362
- (B) 380
- (C) 428
- (D) 452
- (E) 474

Starting with 11, each prime number is multiplied with the next number as below,

$$11 \times 12 = 132$$

$$13 \times 14 = 182$$

$$17 \times 18 = 306$$

$$19 \times 20 = 380$$

$$23 \times 24 = 552$$

**The correct answer is B.**

**84.** A company sells two types of mobile phones – A and B. The total sales of these two phones increased by 24% between 2010 and 2015. In the same period, however, the sales of 'B' type mobile phones, most of which were sold from the company's exclusive outlets, grew by just 6%.

Which of the following conclusions about the company's sales from 2010-15 is best supported by the statements above?

- (A) Buyers were more likely to buy type 'A' mobile phones when they went to multi brand phone sellers.
- (B) The prices of mobile phones purchased at the company's exclusive stores were higher than those phones that were purchased elsewhere.
- (C) The sales of type 'A' mobile phones increased by more than 24% during this period.
- (D) A majority of Type 'B' mobile phones were purchased by corporate buyers who tend to make bulk purchases.
- (E) The number of people who bought mobile phones from multi brand sellers increased during this period.

This is basically a question which tests averages. If the average of A and B is 24%, out of which B is only 6%. Then A has to be greater than 24%. None of the other options can be inferred for sure.

**The correct answer is C.**

**85.** Economists have discovered that, at comparable income levels, people living in rural areas generally have more purchasing power than people living in cities. This is because some of the income that city dwellers use for food and housing can be used by rural dwellers for other needs.

Which of the following assertions is implied the most in the above statements?

- (A) People in both rural and urban areas tend to spend a large proportion of their income on food and housing.
- (B) The actual income of city dwellers is more as compared to rural dwellers.
- (C) People living in rural areas have lower food and housing costs than people living in cities.
- (D) While city dwellers earn more, they also spend more because of higher food and housing costs.

- (E) City dwellers save a larger proportion of their income than rural dwellers.

If both rural and city dwellers earn the same income, yet the rural dwellers have a greater purchasing power, it must be because the city dwellers are spending more on food and housing, making C the answer. None of the other options can be concluded for sure from the given statements.

The correct answer is C.

86. According to a report by the American Staffing Federation (ASF), the government's new policy for the retail industry is likely to create 2 million jobs for fresh graduates over the next three years. The ASF has, thus, welcomed the government's move to implement this policy across the nation as its implementation will lead to a lower national unemployment rate.

Which of the following, if true, would cast the most serious doubt on the accuracy of ASF's conclusion?

- (A) Opponents of the policy will not allow the government to implement the policy anytime soon.
- (B) The new policy will result in a large number of uneducated workers becoming redundant and, as a result, losing their jobs.
- (C) There are several other ways of lowering the national unemployment rate available to the government.
- (D) The nation faces more serious problems than unemployment and the government should instead focus on resolving those first.
- (E) The implementation of the new policy is going to cost the government a considerable amount of money so the government will most likely increase corporate tax rates to recover this amount.

The argument concludes that the government's new policy to create jobs should be supported because it will create a large number of jobs for a particular group—fresh graduates. However, if there was evidence to show that this policy could lead to large scale job loss in another segment (uneducated workers), then the benefits of the policy would be negated. B does this and is the correct answer.

- (A) The question is not whether the policy will be implemented or not, but whether the policy should be implemented.
- (B) The correct answer.
- (C) We are not concerned about the other ways but about whether this new policy should be that way.

- (D) The other problems that a nation faces are outside the scope of the argument.
- (E) The government might be willing to foot the cost if the returns are worth it, so this does not necessarily weaken the argument.

The correct answer is B.

87. It may soon be possible to insure your Facebook, Twitter and other social media accounts against the nuisance of hacking as a company has launched the country's first social media insurance. The insurance includes the cost of disabling accounts, suppressing offensive material and stopping any legal action triggered by hacking; for example, if a hacker posts illegal material under a victim's name.

Which of the following can properly be inferred from the statements above?

- (A) Social media insurance will make it possible for individuals to sue hackers who post offensive content in their name.
- (B) The launch of social media insurance will, most likely, lead to a fall in the incidence of hacking on social media sites such as Facebook and Twitter.
- (C) There is a cost associated with enabling and disabling a social media account.
- (D) Under current laws it is possible for a person to be sued for posting offensive material online even if the person did not post the material himself.
- (E) Social media insurance will only be available for Facebook and Twitter users.

Since this is an Inference question, let's look at each option and eliminate.

- (A) There is no connection between insurance and the ability to sue someone. Insurance will just compensate an individual for the damages incurred because of the acts of a hacker.
- (B) This may or may not be the case but doesn't necessarily have to be the case.
- (C) We know there is a cost associated with disabling an account but we don't know whether there is a similar cost associated with enabling an account.
- (D) The correct answer. The argument states that social media insurance will stop any legal action triggered by a hacker posting something offensive in the user's name. Thus, under the current laws, it must be possible to sue a person for an offensive online act that he hasn't himself committed.



- (E) The argument uses Facebook and Twitter as examples but also mentions other social media accounts.

**The correct answer is D.**

**Question 88** consists of a statement followed by two or more conclusions. Assume everything in the given statement to be true, and then decide which of the conclusions logically follow from this statement. Select your answer from the following choices:

- 88. Statements:** All cricketers are sportsmen. Some cricketers are married. Some sportsmen are rich. All footballers are sportsmen.

**Conclusion I** Some rich sportsmen are cricketers.

**Conclusion II** Some married people are cricketers.

**Conclusion III** Some sportsmen are footballers.

**Conclusion IV** Some cricketers are footballers.

- (A) Only conclusion II follows  
(B) Conclusion I and II follow  
(C) Both II and III follow  
(D) Both II and IV follow  
(E) Only conclusion III follows

Since all sportsmen are not cricketers, Conclusion I may or may not be true.

If some cricketers are married, then some married people are definitely cricketers. Thus, Conclusion II is correct.

If all footballers are sportsmen, then some sportsmen are definitely footballers. Thus, Conclusion III is also correct.

Conclusion IV cannot be arrived at from the given statements for sure.

**The correct answer is C.**

**Directions for Questions 89–90:** In each question below is given a statement followed by two conclusions numbered I and II. You have to assume everything in the statement to be true, then consider the two conclusions together and decide which of them logically follows beyond a reasonable doubt from the information given in the statement.

Select from the following options:

- (A) Only conclusion I follows  
(B) Only conclusion II follows  
(C) Either I or II follows  
(D) Neither I nor II follows  
(E) Both I and II follow

- 89. Statement:** A situation is never good or bad. It is our perception of it that makes it appear good or bad to us.

**Conclusion I** Some people may find a situation good, whereas some others may find the same situation bad.

**Conclusion II** In order to be happy, one must learn to manage his perceptions.

From the given statement, Conclusion I can definitely be arrived at because two people with different perceptions may find the same situation good and bad, respectively.

The statement makes no mention of what one should do in order to be happy. Thus, Conclusion II is not valid.

**The correct answer is A.**

- 90. Statement:** Tendulkar was blessed with natural ability, no doubt, but even he had to practice for hours to excel in his field.

**Conclusion I** Natural ability by itself may not guarantee excellence.

**Conclusion II** Had Tendulkar not practiced for hours, he would not have excelled in his field.

From the given statement, Conclusion I can be clearly inferred. The use of *may not* makes this option particularly good as one cannot counter this argument.

Conclusion II, on the other hand, is suspect. For all we know, Tendulkar might have excelled in his field even had he not practiced for hours. So, Conclusion II is not valid.

**The correct answer is A.**

- 91. Statement:** Kavita is going to appear for an aptitude test in two months. To successfully clear this test, a person needs to do two things—take 20 practice tests and also attend 15 coaching sessions by a popular teacher. Nobody who has failed to meet the previous two criteria has ever cleared this test. If Kavita takes the 15 coaching sessions, she will only have enough time to attempt 15 practice tests and if she attempts 20 practice tests, she will only have enough time to take 10 coaching sessions.

The claims above, if true, most strongly support which of the following conclusions?

- (A) Kavita should take all 15 coaching sessions and then take as many tests as she can since tutoring is more important than practising.

- (B) As long as Kavita takes the 20 practice tests, she will most likely be able to clear the aptitude test.
- (C) Kavita will retake the aptitude test if she is not able to successfully clear it the first time.
- (D) Kavita will most likely not be able to clear the aptitude test.
- (E) If Kavita attends the 15 coaching sessions, she will most likely be able to clear the aptitude test.

The statements clearly state that two conditions need to be met for Kavita to clear the test. The statements then say that the moment Kavita satisfies one of these conditions, she cannot satisfy the second. Then the only valid inference is that Kavita will most probably not be able to clear the aptitude test.

The correct answer is D.

92. Conservation of tigers is a major concern for wildlife experts across the world since the number of tigers left in the wild is rapidly declining. While several countries are taking steps to counter this fall, experts are unanimously of the opinion that if the tiger is to survive in the wild, its best chances of doing so are in India.

The claims above, if true, most strongly support which of the following conclusions?

- (A) The survival of the tiger is under threat in countries other than India also.
- (B) If the tiger fails to survive in India, it will become extinct.
- (C) The Indian government is not taking enough steps to check the poaching of tigers.
- (D) The maximum number of tigers in the world are found in India.
- (E) The number of tigers outside India is falling at a faster rate than within India.

If the best chances of tiger's survival are in India, then its survival must be under threat in other countries as well. Otherwise, the best chances of its survival would have been in some other country. Thus, A is the correct answer.

The correct answer is A.

93. The list of the highest paying cities in the world is headed by cities in Switzerland. This serves to reaffirm the fact that people in Western European cities on average earn three times more than those in Eastern Europe. The fact that, in Switzerland, deductions from salaries are relatively low, further

widens the gap between net wage level earned there and in other countries, especially in the rest of Western Europe. The largest wage differences are in Asia, where the highest value (Tokyo) is twelve times higher than the lowest (Delhi).

Which of the following can be inferred from the statement above?

- (A) The Swiss pay less money in taxes than people in the rest of Western Europe.
- (B) Delhi is the poorest city in the Asian continent.
- (C) The wage difference between the richest and poorest cities of Eastern Europe is less than twelve times.
- (D) Switzerland is not situated in Western Europe.
- (E) Tokyo has more rich people than Delhi.

Since this is an Inference question, let's analyse each option one by one.

- (A) We know that the Swiss have lower deductions from their salaries but we don't necessarily know why; it may be on account of high taxes or it may be for some other reason.
- (B) All that the stimulus tells us is that the average wage in Delhi is considerably lower than in Tokyo. We don't even know whether we have data for each city in the Asian continent so there is no way we can conclude that Delhi is the poorest city in the continent.
- (C) The correct answer. The argument states that the difference between the highest and lowest wage rates is highest in Asia, so it has to be lower in all other places such as Eastern Europe.
- (D) The statement suggests that Switzerland is most likely situated in Western Europe.
- (E) Again this depends on the population of the two countries because the wage level in consideration is an average. So it's possible for Delhi to have more rich people than Tokyo but since Delhi also has many more relatively poorer people, this fact pulls the average wage down.

The correct answer is C.

94. The main purpose of business is to maximise shareholder value over the long-term by selling goods or services. Thus, employees who use funds for anything other than to increase their sales are simply cheating the shareholders.

Which of the following is an assumption made in drawing the conclusion above?

- (A) Most business owners would agree with the above definition of the purpose of a business.

- (B) Increasing sales is not the only way to maximise shareholder value.
- (C) Spending money on making the workplace more comfortable for employees will not lead to increased worker productivity and in turn increased business profits.
- (D) The only function of a business is to maximise returns for its shareholders.
- (E) According to this definition, many employees could be accused of cheating.

The argument assumes that the only way to maximise owner's value is by increasing sales. This can lead us to several passive assumptions. C contains one such assumption. Notice that if you negate C, the argument will fall apart.

- (A) Whether business owners agree with this definition is irrelevant.
- (B) This weakens the argument whereas we need to find an assumption.
- (C) The correct answer.
- (D) This is directly stated in the argument so cannot be its assumption.
- (E) This could be an inference but is definitely not an assumption.

**The correct answer is C.**

**Questions 95–97** consist of a statement followed by two decisions. You have to assume everything in the statement to be true and, on the basis of the information given in the statement, decide which of the suggested courses of action logically follow(s). Select from the following choices:

- (A) If only I follows
- (B) If only II follows
- (C) If either I or II follows
- (D) If neither I nor II follows
- (E) If both I and II follow

- 95. Statement:** The Korean garment export industry venturing into the Latin American markets faces tough competition from the Chinese.

**Courses of Action: I** Garment manufacturers from Korea should drop the plans of entering Latin America.

**Courses of Action: II** Garment manufacturers from Korea should improve the quality of their products so that they are able to compete better with the Chinese.

Option I is not correct since running away from the problem is not a solution. Option II makes logical sense.

**The correct answer is B.**

- 96. Statement:** The influx of apples imported from California in Indian stores has considerably reduced the demand for indigenous apples, which tend to be of an inferior quality.

**Courses of Action: I** The government should force Indian stores to stop selling the imported apples and incentivise them to sell Indian apples.

**Courses of Action: II** To help indigenous apple growers, the government should impose high import duties on imported apples.

The statement says that the imported apples are of a better quality. Thus, to compete against them, Indian apple growers should take steps to improve the quality of their apples. Both of the options provided are unethical and should not be pursued.

**The correct answer is D.**

- 97. Statement:** The state owned airline has been continuously making losses for the past several years with no signs of profits anytime soon.

**Courses of Action: I** The government should provide a bailout package to the airline in order to ensure that it does not collapse.

**Courses of Action: II** The government should take steps to ensure that the airline improves its productivity and reduces wasteful expenditure.

Providing a bailout package would be similar to throwing good money after bad. If the airline cannot become profitable, it might be a better idea for it to shut down. Steps must be taken to try and make the airline profitable by cutting excess expenditure and improving efficiencies. Thus, only B makes sense.

**The correct answer is B.**

- 98. A jewellery manufacturer produces rings in two metals—gold and platinum. The manufacturer has noted that, over the last three years, the gold rings have consistently outsold the platinum ones by a large margin, even though the designs available in both the metals are exactly the same. This has led**

the manufacturer to conclude that consumers prefer gold to platinum.

Which of the following, if true, most seriously weakens the argument?

- (A) Over the last three years, diamond rings have outsold both gold and platinum ones.
- (B) Jewellery buyers give more importance to design than to the metal used.
- (C) Platinum is easier to maintain than gold.
- (D) Platinum rings take longer to produce than gold rings.
- (E) Gold rings cost considerably less than platinum ones.

The argument concludes that just because gold rings sell more than platinum rings, customers prefer the metal gold to the metal platinum. But there can clearly be other reasons why customers prefer gold ring to platinum ones—maybe the gold rings are cheaper or have better designs or are easier to resell. Any such option can weaken the argument. E highlights the cost aspect and should be the correct answer

- (A) The argument is only concerned with gold and platinum rings. Diamond rings are outside the scope of the argument.
- (B) This does not necessarily suggest that customers don't pay attention to the metal used or that gold rings have better designs than platinum ones. Maybe the second item on the customers' preference checklist, after the design, is the metal used.
- (C) So then platinum rings should be selling more, why are gold rings selling more?
- (D) How much time it takes to produce a ring in either metal is irrelevant.
- (E) The correct answer.

The correct answer is E.

99. In the equation below, every letter represents a unique digit. If the value of E is greater than the value of R and the value of D is smaller than the value of I, then which of the following statements is true?  
(Real NMAT Question)

	T	R	U	E
+	I	D	E	A
	E	9	I	I

- (A) Letter 'A' will definitely have the highest value among all letters.

- (B) Letter 'I' will definitely have the lowest value among all letters.
- (C) The difference between the values of 'A' and 'R' will definitely be 2.
- (D) Letter 'E' and letter 'I' will definitely represent consecutive numbers.
- (E) Letter 'U' and letter 'A' will definitely represent consecutive numbers.

Here no 2 values are the same so U is not equal to A. Now  $E + A = I$  or 11.

Let  $E + A = I$ . Then  $U + E$  must be 11. But it is not possible as in such a case U must be  $10 + E$  which is not possible.

So, we have 1 case only  $E + A = 11$ . Hence there is 1 as carry over. Then  $U + E + 1 = 11$ .

We can say,  $E + A = U + E + 1 = 11$ .

So,  $E + A = U + E + 1$  or  $A = U + 1$ .

Hence U and A must be 2 consecutive numbers.

The correct answer is E.

100. As Peter Parker's Uncle Ben says to him: 'With great power comes great responsibility.'  
(Real NMAT Question)

The argument above assumes that:

- (A) Uncle Ben is always right.
- (B) At least some people follow Uncle Ben.
- (C) Peter Parker has got some great powers.
- (D) Peter Parker listens to what his uncle says.
- (E) Uncle Ben sometimes lends his words of wisdom to Peter Parker.

A, B, C or D could not be the assumption because they don't necessarily have to be implicit in the statement.

However, if E is true then it means Uncle Ben sometimes lends his words of wisdom to Peter Parker and so it leads to the given statement and so it can be the assumption.

The correct answer is E.

101. Given below are two rows of data. In the first row is a number series. In the second row, is a number followed by (A), (B), (C), (D). (Real NMAT Question)

If both the series follow the same logic, then what will come in place of (D) in the second row?

4	9	29	119	599
8	(A)	(B)	(C)	(D)

- (A) 205  
(B) 413  
(C) 876  
(D) 1079  
(E) 1814

The logic is  $T_{n+1} = n(T_n + 1) - 1$

$$T_2 = 2(T_1 + 1) - 1 = 2(4 + 1) - 1 = 10 - 1 = 9$$

$$T_3 = 3(T_2 + 1) - 1 = 3(9 + 1) - 1 = 30 - 1 = 29$$

$$T_4 = 4(T_3 + 1) - 1 = 4(29 + 1) - 1 = 120 - 1 = 119$$

$$T_5 = 5(T_4 + 1) - 1 = 5(119 + 1) - 1 = 600 - 1 = 599$$

Now it can be used to find required values as

$$(A) = T_2 = 2(T_1 + 1) - 1 = 2(8 + 1) - 1 = 18 - 1 = 17$$

$$(B) = T_3 = 3(T_2 + 1) - 1 = 3(17 + 1) - 1 = 54 - 1 = 53$$

$$(C) = T_4 = 4(T_3 + 1) - 1 = 4(53 + 1) - 1 = 216 - 1 = 215$$

$$(D) = T_5 = 5(T_4 + 1) - 1 = 5(215 + 1) - 1 = 1,080 - 1 = 1,079$$

The correct answer is D.

102. The Chief Medical Officer of a district conducted a survey of 1,000 people; he found that 70% of the people who ate a particular variety of meat were resistant to antibiotic 'X', while 90% of the remaining people were not resistant to that antibiotic. He conducted further research to identify the reason behind it. It was identified that small doses of 'X' antibiotic was given to the animals whose meat 70% of the people had eaten. (*Real NMAT Question*)

Which of the following can be concluded from the passage above?

- (A) Meat is a good source of antibiotic 'X'.  
(B) Eating meat is an unhealthy habit, leading to several diseases.  
(C) Meat consumption makes the human body prone to certain diseases.  
(D) Small doses of antibiotic taken regularly make people immune to the antibiotic.  
(E) The animal body reacts in the same way as the human body towards antibiotic 'X'.

According to the passage, the people who ate a particular variety of meat were resistant to antibiotic 'X'. It is also given that small doses of 'X' antibiotic were given to the animals whose meat 70% of the people had eaten. So, small doses of antibiotic were taken regularly by people who consumed meat. As these people are resistant to antibiotic X, we can conclude statement (D).

The correct answer is D.

**Directions for Questions 103–106:** Read the following information and answer the questions that follow.

Sarah, Caitlin, Megan, Amy, Jessica, Emma, Amber and Zoe are sitting around a circular table facing the centre. Each one of them has a favourite fruit or vegetable—dandelion, eggplant, apple, tomato, cherry, spinach, broccoli and beetroot. Sarah sits third to the right of the person who likes tomato. Amy sits second to the left of Amber.

Amber is not an immediate neighbour of the person who likes tomato. Only one person sits between Caitlin who likes spinach and the person who likes tomato.

The person who likes apple sits third to the right of the person who likes spinach. Zoe sits between the person who likes apple and the person who likes eggplant. Jessica is not an immediate neighbour of Zoe.

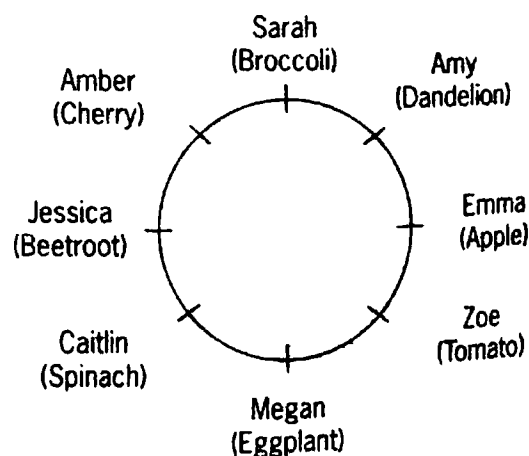
The person who likes eggplant sits third to the right of the person who likes cherry. Only one person sits between the person who likes broccoli and Emma. Jessica likes neither broccoli nor dandelion.

103. Who sits third to the right of Megan?

- (A) Amber  
(B) Emma  
(C) The person who likes dandelion  
(D) Zoe  
(E) The person who likes beetroot

We have to arrange eight people in a circular arrangement. It is better to start by fixing the position of Caitlin who likes spinach. Now the position of the person who likes apple can be fixed. Similarly, we can fill the other positions.

The final arrangement will look like this:



All the questions can now be easily answered.

The correct answer is C.

104. Which of the following statements must be true?

- (A) Zoe likes dandelion.
- (B) The person who likes cherry sits to the immediate left of Sarah.
- (C) Amy sits two places to the right of Amber.
- (D) Caitlin sits two places to the left of the person who likes tomato.
- (E) Jessica likes broccoli.

Check explanation to Q 103

The correct answer is D.

105. What is the position of the person who likes broccoli with respect to Zoe?

- (A) 3<sup>rd</sup> to the left
- (B) 4<sup>th</sup> to the right
- (C) 5<sup>th</sup> to the left
- (D) 4<sup>th</sup> to the left
- (E) 2<sup>nd</sup> to the right

Check explanation to Q 103

The correct answer is C.

106. Which of the following combinations is not correct?

- (A) Amber - cherry
- (B) Emma - apple
- (C) Amy - dandelion
- (D) Zoe - beetroot
- (E) Caitlin - spinach

Zoe likes tomato.

Check explanation to Q 103

The correct answer is D.

Questions 107-112 consist of a statement followed by two decisions. Assume everything in the statement to be true and, on the basis of the information given, decide which of the suggested courses of action logically follow(s). Select your answer from the following choices:

- (A) Only I follows
- (B) Only II follows
- (C) Either I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

107. **Statement:** There has been a significant drop in the level of water in the main reservoir that supplies water to the city.

**Decision I**

The city administration should appeal to all residents to cut down on their consumption of water.

**Decision II**

The city administration should cancel the license of all water parks operating in the city.

While Decision I makes sense, Decision II appears unnecessarily harsh as there is no justification for cancelling the licenses of water parks. At best, they can be asked to be conservative with their use of water. Thus, only Decision I is a logical decision.

The correct answer is A.

108. **Statement:** Because of the availability of China-made firecrackers, the sales of firecrackers made in India have fallen drastically.

**Decision I**

The import of firecrackers from China should be banned.

**Decision II**

The Indian firecracker companies should give huge discounts on their products to match the prices offered by the Chinese vendors.

In today's time of liberalisation and a move towards free trade, it does not make sense to prohibit the import of an item simply to protect domestic firms. Thus, Decision I is not logical. It may not be possible for Indian manufacturers to match the discounts offered by the Chinese vendors. We cannot expect them to sell their firecrackers at a loss. Thus, Decision II is also not a logical one.

The correct answer is D.

109. **Statement:** The female to male ratio in the state has become alarmingly low.

**Decision I**

All families with a girl child should be offered incentives such as free housing and other monetary allowances.

**Decision II**

Residents of the state should be educated about the importance of having a girl child.

It is not a good idea to offer people incentives, such as housing, because then people will have a girl child but will not bring her up properly. It is a much better idea to educate people about the importance of having a girl child so that the problem is taken care of at the grass-roots level itself.

The correct answer is B.

110. **Statement:** There have been several incidences lately of doctors recommending medicines manufactured by those companies that offer huge commissions to these doctors.

**Decision I**

There should be a complete ban on the payment of commission by medicine companies to doctors.

**Decision II** The doctors who are found guilty of such acts should be severely punished to discourage other doctors from following their footsteps.

The profession of a doctor is an important one as it involves dealing with people's lives. To prevent a conflict of interest, there should be a complete ban on payment of commission by medicine companies to doctors. Doctors who are found guilty of such acts should also be punished. Thus, both the decisions follow from the statement.

**The correct answer is E.**

- 111. Statement:** There is a huge amount of garbage dumped on the northern side of Mount Everest from where thousands of climbers attempt to climb the summit every year.

**Decision I** The climbers should be encouraged to climb from the southern side of the mountain instead.

**Decision II** There should be a complete ban on any climbing activity on Mount Everest.

Asking the climbers to climb from the southern side is not a solution to the problem as they would then litter the southern side. Banning climbing completely is also not a practical solution to the problem. Thus, neither Decisions I nor II follows.

**The correct answer is D.**

- 112. Statement:** Several incidents of ragging have been reported from medical colleges in the state.

**Decision I** The government should ignore these incidents as ragging helps build a bond between senior and junior students.

**Decision II** The government should ensure that colleges take strict action against those found guilty of ragging.

There really cannot be any justification for ragging. In fact, those perpetrating this act should be strongly punished. Thus, Decision I is not logical but Decision II is.

**The correct answer is B.**

**Directions for Questions 113–116:** Read the below information and answer the questions that follow.

Six people: C, D, E, F, G and H are standing in a straight line facing North, not necessarily in the same order. F is standing second to the left of D. C is standing fourth to the left of H and H is not standing on the extreme end of the line. D is standing second to the left of E.

- 113.** What is the position of F with respect to E?
- (A) Immediate left  
(B) Fourth to the left  
(C) Third to the left  
(D) Third to the right  
(E) None of these

The final arrangement will look like this:  
C F G D H E ↑

All the questions can now be easily answered.

**The correct answer is B.**

- 114.** Which of the following pairs represents the people standing at the extreme ends of the line?

- (A) CE  
(B) FH  
(C) FE  
(D) CH  
(E) None of these

Check explanation for Question 113.

**The correct answer is A.**

- 115.** Who is standing second to the right of F?

- (A) H  
(B) D  
(C) G  
(D) E  
(E) None of these

Check explanation for Question 113.

**The correct answer is B.**

- 116.** Four of the following five pairs are alike in a certain way based on their position in the above arrangement and so form a group. Which of the following pairs do not belong to the group?

- (A) GC  
(B) GE  
(C) HG  
(D) DE  
(E) FD

All the other pairs have a gap of one place between them.

**The correct answer is B.**

**Directions for Questions 117–123:** In each of the following questions two statements are given and these

statements are followed by two conclusions numbered I and II. You have to take the given two statements to be true even if they seem to be at variance from commonly known facts. Read the conclusions and then decide which of the given conclusions logically follows from the two given statements, disregarding commonly known facts.

Select from the following options:

- (A) Only Conclusion I follows
- (B) Only Conclusion II follows
- (C) Either Conclusion I or II follows
- (D) Neither I nor II follows
- (E) Both I and II follow

117. **Statements:** All cars are automobiles. All automobiles are trucks.

**Conclusion I** All trucks are cars.

**Conclusion II** All cars are trucks.

All automobiles are trucks does not imply that all trucks have to be automobiles. Therefore, all trucks may not also be cars. Thus, Conclusion I is incorrect.

If all cars are automobiles and all automobiles are trucks, then all cars have to be trucks. Thus, Conclusion II is correct.

The correct answer is B.

118. **Statements:** Some magazines are books. All novels are books.

**Conclusion I** Some books are novels.

**Conclusion II** Some books are magazines.

From the second statement, some books must be novels. Thus, Conclusion I is true.

From the first statement, some books must be magazines. Thus, Conclusion II is true.

The correct answer is E.

119. **Statements:** Some goods are broken. Some broken are free.

**Conclusion I** Some goods are free.

**Conclusion II** All free is broken.

The goods that are broken and the broken that are free may not have any overlap between them. Thus, we cannot conclude for sure that some goods are free. Hence, Conclusion I is incorrect.

From the second statement, it can be inferred that some free are broken, but we cannot infer that all free is broken. Thus, Conclusion II is also incorrect.

The correct answer is D.

120. **Statements:** All sweaters are hoodies. No hoodie is a jacket.

**Conclusion I** No sweater is a jacket.

**Conclusion II** All hoodies are sweaters.

All sweaters are hoodies and, since no hoodie is a jacket, no sweater can be a jacket. Thus, Conclusion I is correct.

All sweaters are hoodies does not necessarily imply that all hoodies are sweaters. There could be other hoodies as well, which are not sweaters. Thus, Conclusion II is incorrect.

The correct answer is A.

121. **Statements:** All refrigerators are microwaves. Some televisions are refrigerators.

**Conclusion I** Some microwaves are televisions.

**Conclusion II** Some microwaves are refrigerators.

Since some televisions are refrigerators, these televisions, then, must also be microwaves (since all refrigerators are microwaves). Thus, Conclusion I is correct.

If all refrigerators are microwaves, at least some microwaves must be refrigerators. Thus, Conclusion II is correct.

The correct answer is E.

122. **Statements:** No sugar is salt. All salt is spice.

**Conclusion I** No sugar is spice.

**Conclusion II** Some spice is not sugar.

Since the statement does not say that all spice is salt, it is possible that some of this spice (which is not salt) could overlap with sugar. Thus, Conclusion I is not correct.

We know that some spice is salt and we also know that no sugar is salt. Then, this spice (which is salt) cannot be sugar. Thus, Conclusion II is correct.

The correct answer is B.

123. Over the past 2 years, there has been a sharp decline in the number of smokers in college campuses across the city. Over this same period, the city's governing council has spent a lot of money in coming up with advertisements highlighting the harmful effects of smoking targeted at college students. The authorities conclude that its advertisements have been responsible for the drop in cigarette use at college campuses within the city.



Which of the following options most seriously weakens the above argument?

- (A) There has been no similar decrease in the consumption of alcohol among college students.
- (B) There has been no appreciable decrease in the number of smokers within the city who are not in college.
- (C) The supply of cigarettes has remained unchanged within the city.
- (D) A change in the taxation structure has led to a rapid increase in cigarette prices over the last two years within the city.
- (E) Some studies show that there is no direct relation between smoking and the susceptibility to diseases such as lung cancer.

The argument assumes that there can be no other reason for the decrease in the number of smokers except the advertisements by the authorities. Option D weakens this by providing an alternative explanation for the drop in the number of smokers within the city—higher cigarettes prices.

**The correct answer is D.**

- 124.** The sale of badminton racquets in Chennai has tripled in the last year. Thus, it can be concluded that more and more people in Chennai have started playing badminton.

Which of the following options most strengthens the above argument?

- (A) Chennai is famous for its badminton racquets and tourists often buy these racquets when they visit Chennai.
- (B) The sales of badminton racquets in other cities have not shown a similar increase.
- (C) The majority of the badminton racquets sold in Chennai were sold to residents of Chennai.
- (D) The sales of cricket bats and golf clubs have also shown an increasing trend in Chennai.
- (E) Badminton racquets are a popular gift item when residents of Chennai visit their relatives in other cities.

The argument is based on the assumption that most of the badminton racquets sold are actually being used by residents of Chennai. Thus, C is the correct answer. Options A and E actually weaken the argument by suggesting that the increase in sales of badminton racquets may not lead to an increase in the number of residents of Chennai taking up badminton. Options B and D make no difference to the given argument.

**The correct answer is C.**

- 125.** In the last one month, more than a dozen children have been attacked by Rottweilers (a large dog breed) when they stepped out of their house to play. Thus, it is unsafe to keep dogs as pets in neighbourhoods with a large population of children.

Which of the following options most strengthens the above argument?

- (A) Rottweilers have also occasionally attacked adults accompanying the children and even other dogs.
- (B) The Rottweiler is known to be a particularly ferocious dog breed that can attack at the slightest of provocations.
- (C) Small dog breeds like the Pug are very friendly towards children and can be safely kept in neighbourhoods with a large population of children.
- (D) Children need to be taught not to tease dogs or run when a dog comes towards them.
- (E) The behaviour exhibited by Rottweilers towards children is representative of the behaviour of all dogs in general.

The evidence in the argument mentions Rottweilers but the conclusion is for all dogs in general. Thus, the assumption has to be that Rottweilers are representatives of dogs of all breeds, making E the correct answer.

**The correct answer is E.**

- 126.** Pointing to a photograph, an unmarried man, who has only one sister, says, 'The woman in the photograph is the maternal grandmother of my niece.' How is the woman in the photograph related to the man?

- (A) Mother
- (B) Sister
- (C) Daughter
- (D) Mother-in-law
- (E) Aunt

Since the man has only one sister, his niece must be his sister's daughter. So, the niece's maternal grandmother will be the man's sister's mother.

**The correct answer is A.**

**Questions 127–130** consist of two or more sentences followed by four conclusions. Decide which of the given conclusions logically follows from the statements disregarding commonly known facts.

127. **Statements:** No horse is a cat. All the cats are monkeys.

**Conclusion I** No horse is a monkey.

**Conclusion II** No monkey is a horse.

**Conclusion III** Some monkeys are cats.

**Conclusion IV** All monkeys are cats.

- (A) Only II and IV are correct
- (B) Only I and III are correct
- (C) Only III and IV are correct
- (D) Only III is correct
- (E) All four conclusions are correct

All cats are monkeys but this does not mean that all monkeys are cats. There could be some monkeys which are not cats and it is possible for these monkeys to overlap with horses. Thus, conclusions I, II and IV are not valid.

If all cats are monkeys, then there definitely are some monkeys that are cats. Thus, Conclusion III is correct.

The correct answer is D.

128. **Statements:** Some robins are magpies. Some magpies are cranes. All cranes are swans.

**Conclusion I** Some swans are magpies.

**Conclusion II** Some cranes are robins.

**Conclusion III** No cranes are robins.

**Conclusion IV** Some magpies are robins.

- (A) Only I and II are correct
- (B) Only II and IV are correct
- (C) Only II and III are correct
- (D) Only I and IV are correct
- (E) Only II is correct

If all cranes are swans and some magpies are cranes, then it follows that these magpies are also swans. Thus, Conclusion I is valid.

Conclusions II and III are not valid because we do not know anything about all robins or cranes.

Conclusion IV is valid because if some robins are magpies, then some magpies are definitely robins.

The correct answer is D.

129. **Statements:** Some pastries are donuts. Some donuts are croissants. Some croissants are cakes.

**Conclusion I** Some pastries are croissants.

**Conclusion II** Some donuts are cakes.

**Conclusion III** Some cakes are croissants.

**Conclusion IV** Some cakes are donuts.

- (A) Only I and II are correct
- (B) Only I is correct
- (C) Only III is correct
- (D) Only II is correct
- (E) Only III and IV are correct

Some pastries are donuts means that some pastries are also not donuts. Since we don't know which of these two categories of donuts are overlapping with croissants, Conclusion I may or may not be true.

For the same reason Conclusions II and IV also get eliminated.

If some croissants are cakes, then some cakes are definitely croissants. Thus, Conclusion III is correct.

The correct answer is C.

130. **Statements: (Real NMAT Question)**

- (1) Some rats are cats.
- (2) All cats are dogs.
- (3) No dog is a horse.
- (4) All horses are bulls.

**Conclusion I** No dog is a bull.

**Conclusion II** Some dogs are bulls.

**Conclusion III** Some dogs are rats.

**Conclusion IV** Some bulls are rats.

- (A) Only III follows
- (B) I, II and III follow
- (C) Either I or III and IV follow
- (D) All the conclusions follow
- (E) None of the conclusions follow

**Conclusion I**—We know that no dog is a horse, and that all horses are bulls. Now we may have some bulls who are not horses and they can be dogs too. So, conclusion I does not follow.

**Conclusion II**—We know that no dog is a horse, and that all horses are bulls. Now there is a possibility that no dog is a bull. So, conclusion II does not follow.

**Conclusion III**—We know that all cats are dogs and so there must be some dogs who are cats. Some rats are cats and so some cats are rats too. As all cats are dogs, these cats who are rats are also dogs. Hence, some dogs are definitely rats. So, conclusion III follows.

Conclusion IV—There is no logical connection between bulls and rats. So, there is a possibility that no bull is rat. We cannot say that some bulls are rats. Conclusion IV does not follow.

**The correct answer is A.**

131. In a secret language 7 is coded as E, 5 is coded as R, 2 is coded as A, 1 is coded as T, 4 is coded as O, 6 is coded as L and 3 is coded as K. What does 7256 represent?

(A) KARL  
(B) AERL  
(C) EARL  
(D) RATE  
(E) RALE

The correct answer, as can be seen by plugging in the letters for each number, is EARL.

**The correct answer is C.**

132. If HIVE is coded as 6137 and BELT is coded as 9724, how is LIVE coded?

(A) 7213  
(B) 6197  
(C) 7321  
(D) 3124  
(E) 2137

H = 6

I = 1

V = 3

E = 7

B = 9

L = 2

T = 4

Thus, LIVE = 2137

**The correct answer is E.**

133. In a certain code, GARAGE is written as HZSZHD. How is TRUCK written in that code?

(A) BVLQU  
(B) UQVBL  
(C) SQTBJ  
(D) USVDL  
(E) VSUDL

This is an alternate type code. The letters at odd positions move ahead by one step whereas the letters in even positions move back by one step.

**The correct answer is B.**

134. In a certain code, if GREEK is written as HTHIP, what is the code for SPAIN?

(A) TQBLM  
(B) TRDMS  
(C) JYTRP  
(D) LJMDI  
(E) LOIEY

In this code, each letter is replaced with the letter that comes after it. However, this difference keeps increasing by one for every subsequent letter. This is how it works:

G—replace with next letter—H

R—replace with the letter after the next letter—T

E—replace with the letter two letters after the next letter—H

K—replace with the letter three letters after the next letter—P

I—replace with the letter four letters after the next letter—P

**The correct answer is B.**

135. A statement is followed by a few suggested courses of action. A course of action is a step or administrative decision to be taken for improvement, follow-up or further action in regard to the problem, policy, etc. On the basis of the information given in the statement, decide which of the suggested courses of action should logically be pursued.  
(Real NMAT Question)

**Statement:** Decision Review System or DRS was designed as a Player Review for players to seek the third umpire's verdict in those rare and far between cases where they strongly felt that an umpire's decision was definitely and obviously wrong. However, this hasn't been the case. For example, at the review sought by Virender Sehwag after being adjudged LBW on Malinga's ball at the world cup final—while he may have been taking a chance keeping the match situation in mind, he couldn't have known that he was off balance and on the move when he was hit. Ideally, he should have consulted his partner before asking for the review.

What should be done so that only the definitely and obviously wrong decisions are reviewed by the players?

**Decision I** DRS should be scrapped.

**Decision II** The existing system should be reviewed so that a better one could be put in place, which would prevent players from seeking reviews on decisions too frequently.

Decision III

Strict rules about when a player can and cannot appeal for review should be enforced, and severe punishments should be meted out to players who seek reviews more often than not.

- (A) Only I should be pursued
- (B) Only II should be pursued
- (C) Only III should be pursued
- (D) Both I and II should be pursued
- (E) None should be pursued

I is not a good option as by scrapping DRS, players will lose the option of challenging the Umpire's wrong decisions.

II is not good as it will discourage players from using DRS, as a result of which the purpose of DRS won't be served.

III is a viable option as it tries to ensure DRS can be used in a better way. It is a positive solution while both I and II are negative courses of action.

The correct answer is B.

136. What should be the next term in the series 5, 7, 12, 19, 31, 50, \_\_\_?

- (A) 63
- (B) 75
- (C) 81
- (D) 92
- (E) 101

This is a variation of a Fibonacci sequence in which, after the first two numbers, every subsequent number is equal to the sum of the previous two numbers.

The correct answer is C.

137. What term should come in the blank in the below series?

1A2, 4DW, \_\_\_\_\_, 10JQ

- (A) 6TG
- (B) 8VW
- (C) 7WX
- (D) 7GT
- (E) 8XX

The number moves ahead by 3 places in each term.

The middle value moves ahead by 3 places in each term.

The third value moves back by 3 places in each term.

The correct answer is D.

138. In a certain code, 'MERCEDEEZ' is written as 'CDEEEEMRZ'. How is 'CHIMPANZEES' written in this code? (Real NMAT Question)

- (A) ACEEHIMNPSZ
- (B) ACEEGIHMNPS
- (C) AEEGIHMNPSC
- (D) ACEEGHIMSNP
- (E) CHIMAEENPS

Option A is correct. To decipher the code you must arrange the letters in alphabetical order, that is, according to the position of the word in the alphabetic sequence.

The correct answer is A.

139. In a certain code, LEMUR is written as MGPYW. How is ZEBRA written in that code?

- (A) VFRLY
- (B) VGEFA
- (C) AGEVF
- (D) BDESC
- (E) YRVFL

The first letter moves ahead by 1 place, the second letter by 2 places, the third letter by 3 places and so on.

The correct answer is C.

140. In a code language, if REPEL is coded as TGRGN, what is the code for ATTRACT?

- (A) CWTCVE
- (B) BWTCVE
- (C) BWTEVC
- (D) CWTCEV
- (E) CWCTEV

The code has been created by substituting each letter of the original word with the letter that comes two places after it, that is, R becomes T, E becomes G and so on.

The correct answer is D.

141. In a certain code, VANILLA is written as XXPFNIC. How is CARPENTER written in that code?

- (A) NBVFGHYTR
- (B) RTYUHGFDI
- (C) OPIUJKLHB
- (D) MGTHYUIKT
- (E) EXTMGKVBT

The letters at odd positions move ahead by 2 places.  
The letters at even positions move back by 3 places.

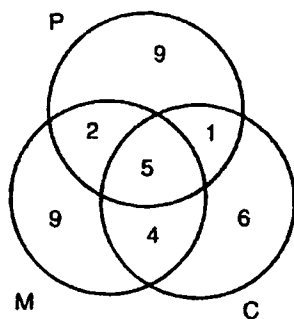
The correct answer is E.

142. In a class, math was taken by 20, physics by 17, chemistry by 16, math and chemistry by 9, math and physics by 7, physics and chemistry by 6 and all three subjects by 5. Find the number of students who have taken only one subject.

(Real NMAT Question)

- (A) 10  
(B) 15  
(C) 24  
(D) 26  
(E) 27

Let us represent the given information in the form of a Venn diagram as below:



Our desired answer =  $9 + 9 + 6 = 24$

The correct answer is C.

143. There are 3 couples in a family of 10 members covering 2 generations. KK has 2 brothers. Gudiya has 2 sons, Mann and Gudda. SK has one son Aryan, and is the brother in law of Gudiya. AK has one son Shrajan and 3 nephews. Rolly is the sister in law of AK. Who is married to SK? (Real NMAT Question)

- (A) Data is insufficient  
(B) Gudiya  
(C) Gudiya / Rolly  
(D) Neither of them  
(E) Rolly

Since, SK has one son Aryan, and is the brother-in-law of Gudiya, Gudiya could be the wife of either KK or AK. However, AK has only one son whereas Gudiya has 2 (given that Gudiya has 2 sons, Mann and Gudda); hence, Gudiya has to be the wife of KK. Now, since Rolly is the sister-in-law of AK, she couldn't have been married to AK; hence, she is the wife of SK.

The correct answer is E.

144. (Real NMAT Question)

a	b	c	d	e	f	g	h	i	j	k
	6		12		20		32		56	

In the table given above, the numbers representing the letters are written below the letters. For example,  $b = 6$ . It is also known that  $a + c = b$ , where  $a < c$  and  $c + e = d$ , where  $c < e$ ,  $e + g = f$ , where  $e < f$  and so on. No letter has the same number.

What is the value of  $k - i$ ?

- (A) 12  
(B) 14  
(C) 16  
(D) 18  
(E) 20

We have  $a + c = 6$  and  $a < c$ . It is possible only in two cases:

Case 1:  $a = 1$  and  $c = 5$

If we assume case 1 be true then we have  $a = 1$ ,  $c = 5$ ,  $e = 7$  (as  $c + e = 12$ ),  $g = 13$  (as  $e + g = 20$ ),  $i = 19$  (as  $g + i = 32$ ),  $k = 37$  (as  $i + k = 56$ )

Then  $k - i = 37 - 19 = 18$

Case 2:  $a = 2$  and  $b = 4$ . Then,  $e = 8$  (as  $c + e = 12$ ),  $g = 12$  (as  $e + g = 20$ ).

But, we are given that no 2 letters can have same numbers.

So, case 2 is not valid.

Hence by case 1 we have  $k - i = 18$ .

The correct answer is D.

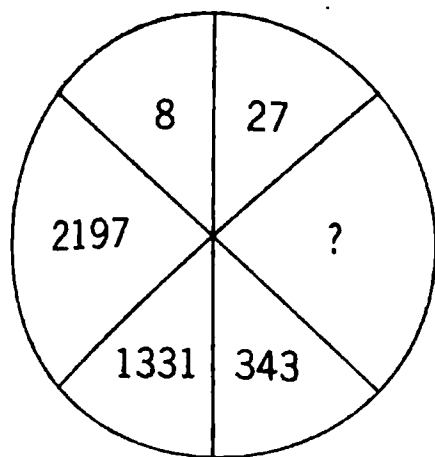
145. In a code language, if ACERBATE is coded as TABRECAE, what is the code for BASEMENT?

- (A) NEMEASBT  
(B) MENESBAT  
(C) NEMESABT  
(D) NEMESATB  
(E) MENESBTA

There are eight letters in the word. In the given code, the fourth and eighth letters from the left have been left intact. The first letter exchanges position with the seventh letter, the second letter with the sixth letter and the third with the fifth letter.

The correct answer is C.

146. What number should come in place of the question mark?



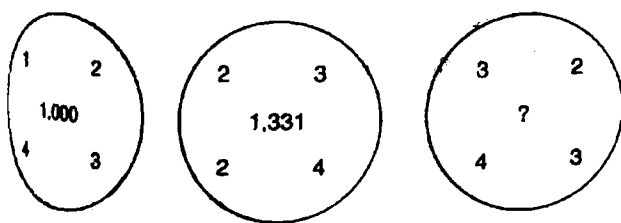
- (A) 64  
(B) 81  
(C) 125  
(D) 249  
(E) 625

The numbers are all cubes of prime numbers— $2^3, 3^3$  and so on.

Thus  $? = 5^3 = 125$

The correct answer is C.

147. Which number should replace the question mark?  
(Real NMAT Question)



- (A) 1,152  
(B) 1,452  
(C) 1,678  
(D) 1,728  
(E) 1,894

Here, if we clearly look at figure 1, we have  $1 + 2 + 3 + 4 = 10$  and  $10^3 = 1,000$  is written in centre.

Similarly, in figure 2,  $2 + 3 + 4 + 2 = 11$  and  $11^3 = 1,331$  is written in centre.

Now, using the same logic in figure 3, we have  $3 + 2 + 4 + 3 = 12$  and the required number must be  $12^3 = 1,728$ .

The correct answer is D.

148. In a certain language, if SCIENCE is coded as 8-24-18-22-13-24-22, then what would be the code for HISTORY? (Real NMAT Question)

- (A) 19-18-8-17-12-9-12  
(B) 19-18-8-7-12-19-2  
(C) 19-18-8-17-12-9-2  
(D) 19-8-18-7-12-9-2  
(E) 19-18-8-7-12-9-2

In the given code S is written as 8, C is written as 24, I is written as 18, E is written as 22, and N is written as 13. All these numbers represents the positions of these letters taken in reverse order. It means if we consider Z as 1, Y as 2 and so on up to A = 26.

Using this logic, the code for HISTORY = 19-18-8-7-12-9-2

The correct answer is E.

149. What number should come in place of the question mark?

2	3	1	2
3	4	4	5
5	6	6	7
30	43	51	?

- (A) 52  
(B) 56  
(C) 62  
(D) 65  
(E) 70

For column 1:  $52 + 32 - 22 = 30$

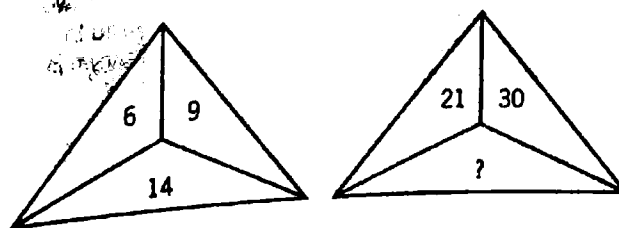
For column 2:  $62 + 42 - 32 = 43$

For column 3:  $62 + 42 - 12 = 51$

Similarly, for column 4:  $72 + 52 - 22 = 70$

The correct answer is E.

150. What number should come in place of the question mark?



- (A) 29  
(B) 37

(C) 41

(D) 47

(E) 53

$$1^2 + 5 = 6$$

$$2^2 + 5 = 9$$

$$3^2 + 5 = 14$$

$$4^2 + 5 = 21$$

$$5^2 + 5 = 30$$

$$\text{Therefore, } 6^2 + 5 = 41$$

The correct answer is C.

151. A man walks West for 6 kms. He then turns right and walks straight for another 8 kms. What is the shortest distance between his starting point and his end point?

(A) 9

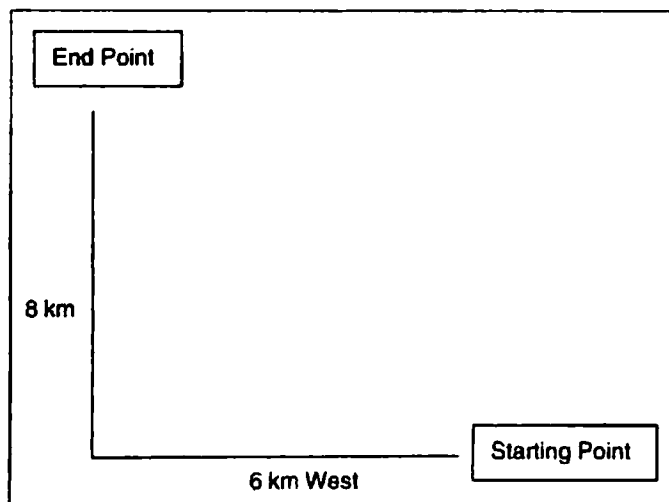
(B) 10

(C) 12

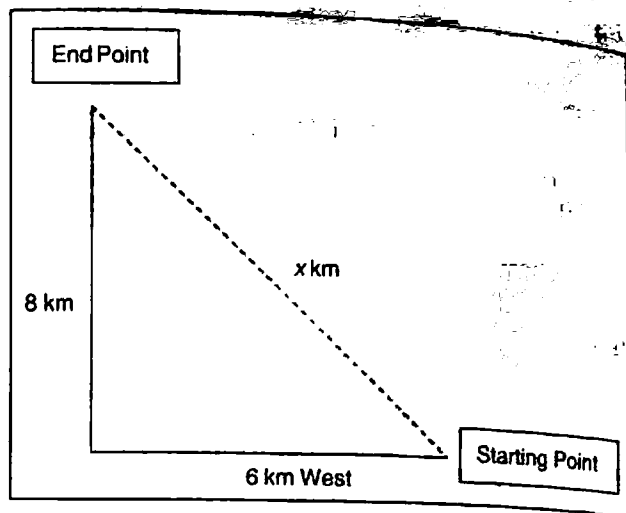
(D) 14

(E) 16

Let us try to represent the given information pictorially:



Remember that the shortest distance between two points is always a straight line. Thus, we need to calculate the length of the dotted line, as shown in the figure below:



Using Pythagoras theorem in the above triangle,

$$6^2 + 8^2 = x^2$$

$$36 + 64 = x^2$$

$$\sqrt{100} = x = 10$$

The correct answer is B.

152. Vishal started to walk after sunrise. After going some distance, he met Sanjay who was coming from the opposite direction. Sanjay's shadow was falling to the right of Vishal. In which direction was Vishal walking?

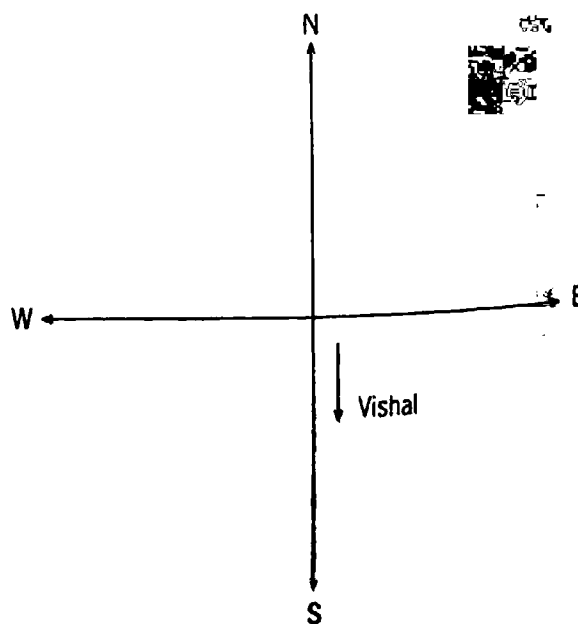
(A) East

(B) West

(C) South

(D) North

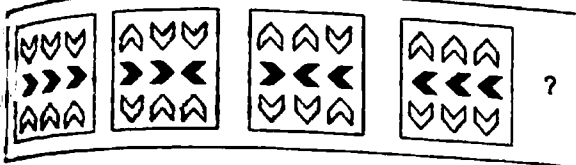
(E) South-west



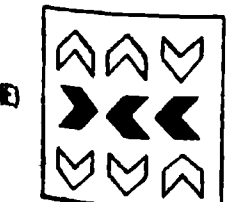
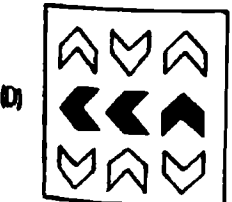
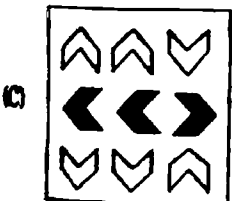
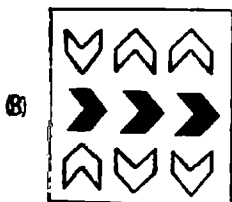
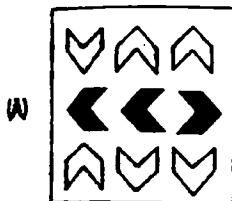
The sun rises in the East. So the shadow of a man in the morning will always fall towards the West. Since the shadow of Sanjay is to the right of Vishal, Vishal must be heading South.

The correct answer is C.

153.



Which of the following should be the next figure in the above series?



The figure has three rows and three columns with three arrows in each row and column. In the second figure, the arrows in the top and bottom positions in the left column swap places. In the third figure, the top and bottom arrows in the

middle column swap places. In the fourth figure, the top and bottom arrows in the right column swap places. This cycle will again continue starting with the left column.

For the middle row, the arrows reverse their direction, one arrow at a time, starting from the right arrow. This cycle will again continue from the right arrow.

The correct answer is A.

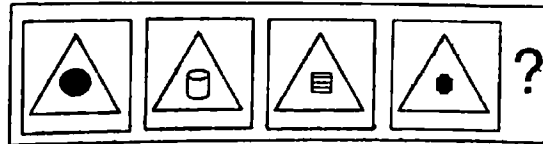
154. In a code language, if ALPINE is coded as 112169145, what is the code for SERPENT?

- (A) 195185142
- (B) 1206345762
- (C) 1765478954327
- (D) 195181651420
- (E) 187654356782

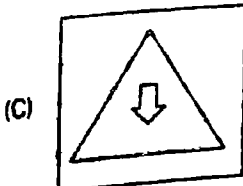
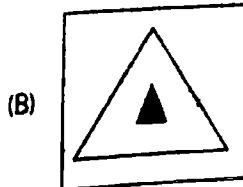
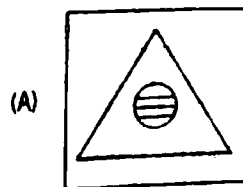
It helps if you have a table of the number that each letter of the alphabet corresponds to in front of you. So, A corresponds to 1, B to 2, C to 3 and so on until you reach Z, which corresponds to 26. From this S = 19, E = 5, R = 18, P = 16, E = 5, N = 14, T = 20. So, the answer is 195181651420, that is, (D).

The correct answer is D.

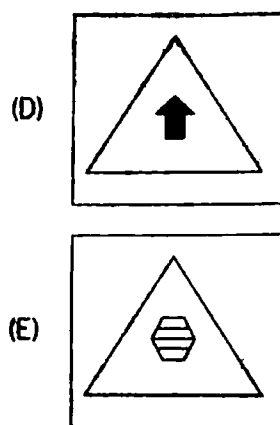
155.



Which of the following should be the next figure in the above series?







If you focus too much on the shapes of the figures inside the triangle, you will get confused because the figures change randomly. The aspect to focus on is the design of the figure—it keeps changing from black to stripes to white to black again and so on. So, in the next figure, the shape in the middle of the triangle should be white in colour. What this shape is makes no difference to us.

**The correct answer is C.**

156. In a code language, if VERITAS is coded as REVISAT, what is the code for LUCIFER?

(A) UCLIREF  
(B) CULIREF  
(C) CULIRFE  
(D) UCLRIFE  
(E) CULRIFE

There are seven letters in the word. In the given code, the fourth letter has been left as is. The order of the first three letters is reversed, so VER becomes REV, and the order of the last three letters is also reversed, so TAS becomes SAT. Applying the same rules to LUCIFER, the correct answer is CULIREF.

**The correct answer is B.**

157. In a code language, if HORIZON is coded as 8699865, what is the code for VIBGYOR?

(A) 4927679  
(B) 4972269  
(C) 4792269  
(D) 4729926  
(E) 4927769

It helps if you have a table of the number that each letter of the alphabet corresponds to in front of you. So A corresponds to 1, B to 2, C to 3 and so on until you reach Z, which corresponds to 26. Also, for letters such as Z which comprise more than 1 digit,

a single digit number is arrived at by adding the two digits. So,  $Z = 26 = 2 + 6 = 8$ .

From this,

$$V = 22 = 2 + 2 = 4$$

$$I = 9$$

$$B = 2$$

$$G = 7$$

$$Y = 25 = 2 + 5 = 7$$

$$O = 15 = 1 + 5 = 6$$

$$R = 18 = 1 + 8 = 9$$

**The correct answer is E.**

158. What number should come next in the series 3, 9, 15, 21, 27, \_\_\_?

(A) 35  
(B) 37  
(C) 36  
(D) 33  
(E) 39

This is a simple addition series where each term is equal to the previous term plus 6. Thus, the next number should be  $27 + 6 = 33$ .

**The correct answer is D.**

159. What number should come next in the series 2, 1,  $\frac{1}{2}$ ,  $\frac{1}{4}$ , \_\_\_?

(A)  $\frac{1}{2}$   
(B)  $\frac{1}{6}$   
(C)  $\frac{1}{4}$   
(D)  $\frac{1}{8}$   
(E) 0

Each term in the series is equal to the previous term divided by 2. Thus, the next number should be  $\frac{1}{4} \div 2 = \frac{1}{8}$ .

**The correct answer is D.**

160. Given alongside is a statement followed by two assumptions numbered I and II. An assumption is something to be taken for granted. Consider both the statement and the following assumptions, and decide which of the assumptions are implicit in the statement. **(Real NMAT Question)**

**Statement:** Developing countries like Brazil and India are actively lobbying against the patenting of the already-expensive life-saving drugs.

**Assumption I** Patenting of drugs will lead to a monopoly and therefore a rise in prices.

**Assumption II** Countries like Brazil and India have different mortality rates.

- (A) Only I is implicit
- (B) Only II is implicit
- (C) Neither I nor II is implicit
- (D) Either I or II is implicit
- (E) Both I and II are implicit

The portion in the statement, 'already-expensive life-saving drugs', points to the fact that these drugs are expensive and patenting would only increase the prices. Hence, Assumption I is implicit.

As for Assumption II, there is nothing in the statement even vaguely pointing to different mortality rates in the countries. Hence, Assumption II is not valid.

The correct answer is A.

161. How many pairs of letters in the word 'STAIRS' have as many letters between them (in either direction) in the word as in the English alphabet?

- (A) None
- (B) 1
- (C) 2
- (D) 3
- (E) More than 3

The pairs of letter are ST and RS, so the answer is 2.

The correct answer is C.

162. Given alongside are a few facts. Based on these facts, select from among the given statements, the statement that can be best concluded. **(Real NMAT Question)**

**Facts:**

- Fact 1: Mr. Sharma has seven cars.
- Fact 2: Two of them are Sedans.
- Fact 3: Two of them are Hatch-backs.

**Statements:**

I Less than half of the cars that Mr. Sharma owns are Sedans and less than half are Hatch-backs.

II Three cars are SUV's.

III Mr. Sharma has Sedans and Hatch-backs only.

- (A) Only I can be concluded
- (B) Only II can be concluded
- (C) Only III can be concluded
- (D) Only I and II can be concluded
- (E) Only I and III can be concluded

Statement I—As total number of cars Mr. Sharma has is 7 and 2 are Sedans and 2 are Hatch-backs.

As,  $2 < 3.5$  (half of total number of cars). So, statement I can be concluded.

Statement II—There is no information given in the 3 facts from which this can be concluded.

Statement III—As four of the cars are Sedans (2) and Hatch-backs (2), the remaining three cars must be of other types. So, statement III cannot be concluded.

The correct answer is A.

163. BABACCDEFKGGHIHJKLZMNORPQRO  
STUPVWNXYMZ

In the above alphabetical series, which is the 15<sup>th</sup> letter to the left of the 5<sup>th</sup> letter from the right?

- (A) Z
- (B) L
- (C) M
- (D) N
- (E) K

5<sup>th</sup> letter from the right = N

15<sup>th</sup> letter to the left of N = Z

Note that this is the same as finding out the 20<sup>th</sup> letter from the left.

The correct answer is A.

164. How many pairs of letters are there in the word 'DEFAMATION' such that in the word, each pair has as many letters between them as there are in the alphabet? **(Real NMAT Question)**

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

The question means that we need to find the number of pairs of letters from this word for which there are as many letters between them in the given word as there are letters between them in the sequence of letters (from A to Z).

For example, we know that 'f' follows 'e' in the of alphabet and in the given word too 'f' follows 'e'. We have to count all such cases in the word 'defamation'. We are not given any direction for the given condition and so the letters can be related in a letter forward or backward manner.

These word pairs are as follows:

- (A) d,e—as there is no letter between them in this word and same in actual sequence of letters.
- (B) d,f—as there is 1 letter between them in this word and same in actual sequence of letters.
- (C) d,a—as there are 2 letters between them in this word and same in actual sequence of letters. However the direction is reverse in this word.
- (D) e,f—as there is no letter between them in this word and same in actual sequence of letters.
- (E) e,a—as there are 3 letters between them in this word and same in actual sequence of letters. However the direction is again reverse.

**The correct answer is E.**

- 165.** What number should come next in the series 14.2, 28.4, 56.8, 113.6, 227.2, \_\_\_?

- (A) 424.4
- (B) 427.4
- (C) 444.4
- (D) 450.4
- (E) 454.4

This is a simple series where each term is equal to the previous term multiplied by 2. So, the next term in the series will be  $227.2 \times 2 = 454.4$ .

**The correct answer is E.**

- 166.** A statement is given followed by two assumptions numbered I and II. An assumption is something to be taken for granted. Consider the statement and the assumptions, and decide which of the assumptions are implicit in the statement.  
**(Real NMAT Question)**

**Statement:** The experience of the self is always a defeat for the ego.

**Assumption I** Revelation of the self is always disastrous for the ego.

**Assumption II** The ego always has an inflated notion about oneself.

- (A) Only I is implicit
- (B) Only II is implicit
- (C) Neither I nor II is implicit
- (D) Either I or II is implicit
- (E) Both I and II are implicit

There is nothing which suggests 'revelation' of self in the statement.

Ego getting defeated due to the experience of self would imply that the ego was inflated.

Thus, only II is implicit.

**The correct answer is B.**

- 167.** In the given question, there are five choices (A-E). Four of them are alike and one is different. Mark the one that is different.

- (A) Kiwi
- (B) Eagle
- (C) Dodo
- (D) Vulture
- (E) Albatross

Dodo is the only extinct bird in the group.

**The correct answer is C.**

- 168.** Man has reached Mars but is still unable to feed everyone on Earth. **(Real NMAT Question)**

Which of the following is implied in the above statement?

- (A) Food is scarce on Earth.
- (B) Mars is a good source of food.
- (C) Man went to Mars to explore agricultural possibilities.
- (D) Advancements in space, science and agriculture are not at par with each other.
- (E) Despite immense advancement in science, the basic need of all people on Earth is unfulfilled.

Statement A and B are not implied in the given statement. Exploring agricultural possibilities on Mars cannot be implied in the given statement. The comparison of space and science with agriculture again cannot be implied. A, B, C and D show no connection with the given statement.

Statement E can be implied in the given statement and should be the correct answer.

**The correct answer is E.**

169. What number should come next in the series  $\frac{1}{21}, \frac{1}{10}, \frac{2}{9}, \frac{3}{8}, \frac{4}{7}, \dots$ ?

- (A)  $\frac{5}{6}$   
 (B)  $\frac{5}{7}$   
 (C)  $\frac{4}{5}$   
 (D)  $\frac{2}{3}$   
 (E)  $\frac{6}{7}$

It is very difficult to spot the pattern behind this series.

The logic behind the series is—starting from  $\frac{1}{21}$ , in each subsequent term you add 1 to the numerator and you subtract 1 from the denominator. So,

The 1st term =  $\frac{1}{21}$  (given in the series as the starting point)

The 2nd term =  $\frac{1+1}{21-1} = \frac{2}{20} = \frac{1}{10}$

The 3rd term =  $\frac{1+1}{10-1} = \frac{2}{9}$

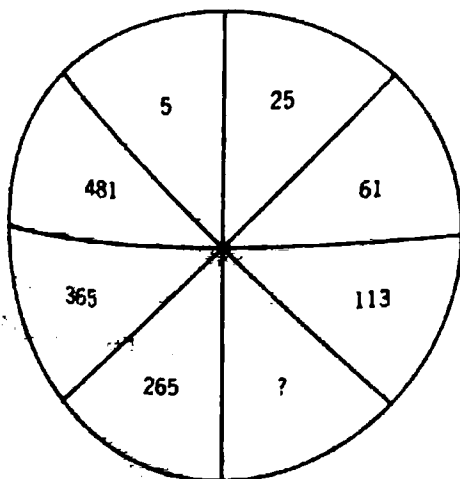
The 4th term =  $\frac{2+1}{9-1} = \frac{3}{8}$

The 5th term =  $\frac{3+1}{8-1} = \frac{4}{7}$

Thus, the next term =  $\frac{4+1}{7-1} = \frac{5}{6}$

The correct answer is A.

170. What number should come in place of the question mark?



- (A) 121  
 (B) 144  
 (C) 164  
 (D) 181  
 (E) 221

$$1^2 + 2^2 = 5$$

$$3^2 + 4^2 = 25$$

$$5^2 + 6^2 = 61$$

$$7^2 + 8^2 = 113$$

$$9^2 + 10^2 = 181$$

The correct answer is D.

**Directions for Questions 171–174:** Based on the information given below, answer the questions that follow.  
**(Real NMAT Question)**

Five people, Kuldeep, Gaurav, Susmita, Pratima, and Devanshu are working in three branches of a company based at Bangalore, Chennai, and Hyderabad. Two people work in Bangalore and two people work in Chennai. Of these four employees, one works in Accounts and another works in Personnel. The remaining are in Marketing. There are 2 Assistant Managers, one Manager, one Director and one Supervisor.

- Gaurav is the Director in the Marketing division at Chennai.
- Pratima is the Manager at neither the Bangalore nor the Chennai branch. She is in the Accounts department.
- The person in the Personnel department is an Assistant Manager in Bangalore.
- Susmita is at the Bangalore branch working as Supervisor and Devanshu is at the Chennai branch.

171. Who is in the Personnel department?

- (A) Devanshu  
 (B) Kuldeep  
 (C) Pratima  
 (D) Susmita  
 (E) Gaurav

This is a case of tabular arrangement where we have 4 columns—Name, City, Area (of job) and Designation.

From 1, we know that Gaurav's designation is Director, the city is Chennai and the Area is Marketing.

From 2, we know that Pratima is in Hyderabad (as she is neither at the Bangalore or the Chennai branch), her area is Accounts and her designation is Manager.

From 3, we don't know the name, but we know there is a person from given 5 who is in Bangalore, his/her designation is Assistant Manager and who works in the Personnel department.

From 4, we know that Sushmita is in Bangalore, her designation is Supervisor and Devanshu is in Chennai.

Putting all this information in table, we get:

Name	City (of branch)	Area (department)	Designation
Gaurav	Chennai	Marketing	Director
Pratima	Hyderabad	Accounts	Manager
	Bangalore	Personnel dept.	Assistant Manager
Sushmita	Bangalore		Supervisor
Devanshu	Chennai		

Now, we can complete the table. As we know, there is just one person left whose name is Kuldeep and so he must be the person who is in Bangalore. His designation is Assistant Manager and he works in the Personnel department.

There are two Assistant Managers, one Manager, one Director and one Supervisor. So, Devanshu must be an Assistant Manager.

As we know, among the four who are in Chennai or Bangalore, two are in Marketing, one in the Personnel department and one is in Accounts. We don't know for sure about Sushmita and Devanshu's area, but we know that one of them works for marketing and the other for accounts.

Now the solution table can be completed as follows:-

Name	City (of branch)	Area (department)	Designation
Gaurav	Chennai	Marketing	Director
Pratima	Hyderabad	Accounts	Manager
Kuldeep	Bangalore	Personnel dept.	Assistant Manager
Sushmita	Bangalore	Accounts/ marketing	Supervisor
Devanshu	Chennai	Accounts/ marketing	Assistant Manager

The answer to the question is clearly Kuldeep, that is, option (B).

**The correct answer is B.**

**172.** In what capacity is Devanshu working?

- (A) Assistant Manager in Marketing
- (B) Assistant Manager in Personnel
- (C) Supervisor in Marketing
- (D) Director in Marketing
- (E) Manager in Accounts

The answer can be clearly seen in the table we made for Q 171.

**The correct answer is A.**

**173.** Which of the following is correct about Kuldeep?

- (A) He is the Assistant Manager in Marketing.
- (B) He is the Assistant Manager in Personnel.
- (C) He is the Supervisor in Marketing.
- (D) He is the Director in Marketing.
- (E) He is the Manager in Accounts.

The answer can be clearly seen in the table we made for Q 171.

**The correct answer is B.**

**174.** Which one is the correct combination?

- (A) Gaurav-Chennai-Accounts
- (B) Pratima-Chennai-Marketing
- (C) Pratima-Chennai-Marketing
- (D) Pratima-Chennai-Marketing
- (E) Kuldeep-Assistant Manager-Personnel

The answer can be clearly seen in the table we made for Q 171.

**The correct answer is E.**

175. What number should come next in the series 50, 41, 33, 26, 20, 15, \_\_\_?

- (A) 5
- (B) 7
- (C) 9
- (D) 10
- (E) 11

The series has been constructed as:

$$1^{\text{st}} \text{ term} = 50$$

$$2^{\text{nd}} \text{ term} = 50 - 9 = 41$$

$$3^{\text{rd}} \text{ term} = 41 - 8 = 33$$

$$4^{\text{th}} \text{ term} = 33 - 7 = 26$$

$$5^{\text{th}} \text{ term} = 26 - 6 = 20$$

$$6^{\text{th}} \text{ term} = 20 - 5 = 15$$

$$\text{So, the next term} = 15 - 4 = 11$$

The correct answer is E.

176. What number should come next in the series 100, 101, 99, 100, 98, 99, 97, \_\_\_?

- (A) 95
- (B) 96
- (C) 97
- (D) 98
- (E) 99

This is a combination of an addition and subtraction series, in which every even term is arrived at by adding 1 to the previous term and every odd term is arrived at by subtracting 2 from the previous term. The next term in the series will be an even term. So, it should be  $97 + 1 = 98$ .

The correct answer is D.

177. If Akhil is the brother of Bharati; Bharati is the sister of Chandan; Chandan is the father of Devesh. How is Devesh related to Akhil?

- (A) Son
- (B) Brother
- (C) Nephew
- (D) Grandson
- (E) Grandnephew

From the given statement, it is clear that Akhil and Chandan are brothers. So, Chandan's son Devesh will be Akhil's nephew.

The correct answer is C.

178. Introducing a girl, a boy said 'she is the daughter of the son of the mother of my mother's sister'. How is the girl related to the boy?

- (A) Sister
- (B) Cousin
- (C) Niece
- (D) Mother
- (E) Grandniece

The mother of the boy's aunt (mother's sister) is the boy's grandmother. Grandmother's son will be the boy's uncle. Uncle's daughter will be the boy's cousin.

The correct answer is B.

Directions for Questions 179–182: Using the information given below, answer the following questions.

(Real NMAT Question)

In a school, there were six teachers—Savita, Harsh, Noorie, Adarsh, Jaswinder and Monica who were assigned the task of training students in different crafts, knitting, paper recycling, baking, jute art, glass painting and paper mache. The teachers were from classes 1 to 6, and had joined the school at different dates, May 1998, Dec 2003, Dec 2004, Sep 2000, Aug 2005 and July 2010, in no particular order. Each teacher also liked to take their students out—one took the kids home, another to the lake side, two to the community centre and two to the fairs.

Some other facts known about the teachers are:

1. Savita taught Class 1, was good at knitting, had not joined the school either in September or in August.
2. Glass painting was a craft that was NOT Monica's cup of tea. She was the latest entrant at the school.
3. The Class 6 teacher liked to invite students home.
4. Adarsh was not from Class 2 or Class 5, he liked to demonstrate how jute could be wetted and so often took his students to the lake side. He had not joined the school in September 2000.
5. Harsh and Noorie, neither of whom were from Class 4 or 5, could host their school-joining anniversary party together, although they didn't join the same day.
6. Noorie was not into paper recycling, was not from class 2 or 6, and took her students to the Community Centre just like Jaswinder.
7. The teacher who taught Class 2 had joined the school in September 2000.

8. The teacher from Class 3 had joined the school in December, 2004 and liked baking.
9. The art of paper mache was taught in the Community Centre.

**General Solution for Questions 179–182:** This is a case of tabular arrangement in which we have 5 columns showing name, craft, class, joining date, and choice (of taking out kids). The information given in statements 1 to 9 can be represented in a table (with blanks for any unknowns) as below:

Statement no.	Name	Craft	Class	Date of Joining	Choice (of taking students out)
1	Savita	Knitting	Class 1	Neither August nor September	
2	Monica	Not glass painting		July 2010 (as she is latest to join)	
4	Adarsh	Jute	Neither class 2 nor class 5	Not in September 2000	Lake side
7			Class 2	September 2000	

Now we haven't used statements 3, 5, 6, 8 and 9 yet.

From 5, we know Harsh and Noorie can host the school joining party together, which means both must have joined in same month and so 1 of them joined in Dec 2003 and the other in December 2004. So, they cannot be inserted in row 4 (as it belongs to a person who joined in September 2000).

From 6, we also have some information about Noorie and all that can be filled in the table.

As, from 5, we know Harsh must have date of joining as December 2003 or December 2004. So he can be added to 6th Row.

Now as we can see, only Jaswindar is left and so he must be put in row 4.

Now Class 5 has only 1 possible position, which is in Row 2 (that is for Monica).

Now we can add new information to the solution table as:

Statement no.	Name	Craft	Class	Date of Joining	Choice (of taking students out)
1	Savita	Knitting	Class 1	Neither August nor September	
2	Monica	Not glass painting	Class 5	July 2010 (as she is latest to join)	
4	Adarsh	Jute	Neither class 2 nor class 5	Not in September 2000	Lake side
7 and 6	Jaswindar		Class 2	September 2000	Community centre
5 and 6	Noorie	Not paper recycling	Neither class 4 nor class 5	Dec 2003 or Dec 2004	Community centre
5	Harsh		Neither class 4 nor class 5	Dec 2003 or Dec 2004	

The only possibility for class 4 is Row 3 (that is Adarsh).

Class 6 can be at Row 5 (Noorie) or Row 6 (Harsh). But we know that the teacher of class 6 likes to take students home. So, it must apply to Harsh. Noorie can be a teacher of class 3 only now.

For both Savita and Monica, the only choice for taking students out is at Fairs.

As the teacher from class 3 joined in December 2004 and taught baking. So, this information can be filled in for Noorie.

As paper mache is taught at the community centre, it must have been taken by Jaswinder.

As Monica is not teaching glass painting, she must be doing paper recycling and Harsh is the teacher for glass painting.

As Savita did not join in August or September, she must have joined in May 1998 and Adarsh must have joined in August 2005.

Statement no.	Name	Craft	Class	Date of Joining	Choice (of taking students out)
1	Savita	Knitting	Class 1	May 1998	Fair
2	Monica	Paper recycling	Class 5	July 2010	Fair
3	Adarsh	Jute	Class 4	August 2005	Lake side
4 and 6	Jaswinder	Paper Mache	Class 2	September 2000	Community centre
5 and 6	Noorie	Baking	Class 3	December 2004	Community centre
7	Harsh	Glass painting	Class 6	December 2003	Home

179. Who is the teacher from Class 3?

- (A) Harsh
- (B) Noorie
- (C) Adarsh
- (D) Monica
- (E) Jaswinder

The answer can be clearly seen in the table we have made on previous page.

The correct answer is B.

180. Which class does Adarsh teach and when did he join the school?

- (A) Class 2, September '98
- (B) Class 3, December '04
- (C) Class 2, December '03
- (D) Class 4, August '05
- (E) Class 6, May '00

The answer can be clearly seen in the table we have made on previous page.

The correct answer is D.

181. What did the two people who could host their joining anniversary party together, train their students on?

- (A) Baking and knitting
- (B) Baking and jute craft
- (C) Baking and glass painting
- (D) Jute craft and glass painting
- (E) Baking and waste paper recycling

The answer can be clearly seen in the table we have made on previous page.

The correct answer is C.

182. Where does Harsh take the students?

- (A) Home
- (B) Park
- (C) Fair
- (D) Either A or B
- (E) Either B or C

The answer can be clearly seen in the table we have made on previous page.

The correct answer is A.

183. Abhishek said to Aakash, 'That boy playing with the dog is the younger of the two brothers of the daughter of my father's wife'. How is the boy playing with the dog related to Abhishek?

- (A) Brother-in-law
- (B) Cousin
- (C) Uncle
- (D) Father
- (E) Brother

Abhishek's father's wife is Abhishek's mother and her daughter is Abhishek's sister. Thus, the brother of the daughter will be Abhishek's brother as well.

The correct answer is E.

184. Pointing to a girl Joginder said, 'She is the daughter of my father's sister.' How is Joginder related to the girl?

- (A) Uncle
- (B) Cousin
- (C) Father
- (D) Grandfather
- (E) Nephew

Joginder's father's sister is Joginder's aunt, which makes the girl Joginder's cousin.

The correct answer is B.

185. Find out the two signs to be interchanged in order to make the following equation correct:

$$8 + 7 \times 6 / 16 - 8 = 48$$

- (A) + and -
- (B) - and /
- (C) + and x
- (D) + and /
- (E) None of the above



Interchanging 'x' and '÷', the equation becomes;

$$8 + 7 \times 6 - 16 \div 8 = 48$$

$$48 = 48 \text{ (LHS = RHS)}$$

The correct answer is B.

186. One evening, Jacky and Jimmy were talking to each other face to face. If Jacky's shadow is falling to the left of Jimmy, which way is Jimmy facing?

(A) North  
(B) South  
(C) East  
(D) West  
(E) South-west

The rules about shadows (given in the theory chapter of this book) clearly state that if your shadow falls to your left in the evening, you must be facing south. Since the shadow is to the left of Jimmy, he must be facing south.

The correct answer is B.

**Directions for Questions 187–190:** A machine does a step-by-step conversion of a code so that the input code gets converted into an output using a certain logic, as shown in the table below. Study this logic and apply it to the new input provided after the table, and then answer the questions that follow. (*Real NMAT Question*)

Input	able	card	must	soil	coin
S1	20	26	73	55	41
S2	B	H	A	A	E
S3	ablet	cardz	mustu	soilc	coino
S4	22	34	74	56	46
S5	V	H	V	D	T

New Input:

cat	mop	sin	bin	till
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### General Solution for Questions 187–190

Here the logic for the machine output steps is as follows:

S1 = addition of positions of letters of input.

For example, for input 'able', S1 = position of a + position of b + position of l + position of e

$$\text{Or, } 1 + 2 + 12 + 5 = 20$$

S2 = adding digits of S1 and if it comes to a two-digit number, then again adding the digits to finally get

a single digit number, and finally writing the letter whose position is that number.

For example, for S1 = 20, we get  $2 + 0 = 2$  and as B is the letter of the alphabet, which has 2<sup>nd</sup> position, so S2 is B.

S3 = add 1 more letter to original input and this letter corresponds to the number of corresponding value of S1. In case this value is more than 26, we will again start from 27 as A.

For example, S1 = 41 = 26 + 15 and so we add the letter with position number 15, which is O (for last column).

S4 = S1 + position of alphabet at S2.

For example, S4 for column 1 is  $20 + 2$  (position of B) = 22.

S5 = the letter corresponding to position of the number at S4.

For example, V corresponds to 22 (for column 1).

So we can generate the machine output for the given new input as:

Input	cat	mop	sin	bin	till
S1	24	44	42	25	53
S2	F	H	F	G	H
S3	Catx	Mopr	sinp	biny	tilla
S4	30	52	48	32	61
S5	D	Z	V	F	I

187. What will be the output of the new input?

(A) V, H, D, V, Z  
(B) V, Z, V, H, D  
(C) D, Z, V, V, Z  
(D) D, Z, V, F, I  
(E) D, Z, V, F, K

The answer can be clearly seen in the table we have made above.

The correct answer is D.

188. What is the last element of Step 2 for the new input?

(A) catt  
(B) 53  
(C) 61  
(D) 63  
(E) H

The answer can be clearly seen in the table we have made above.

The correct answer is E.

189. What will be the first element of the third step?

(A) catx  
(B) catg  
(C) cath  
(D) catk  
(E) cata

The answer can be clearly seen in the table we have made above.

The correct answer is A.

190. What will be Step 2 for the new input?

(A) E, F, G, H, H  
(B) F, H, F, G, H  
(C) 24, 25, 42, 44, 46  
(D) 24, 25, 42, 44, 53  
(E) catg, moph, sini, binj, tillh

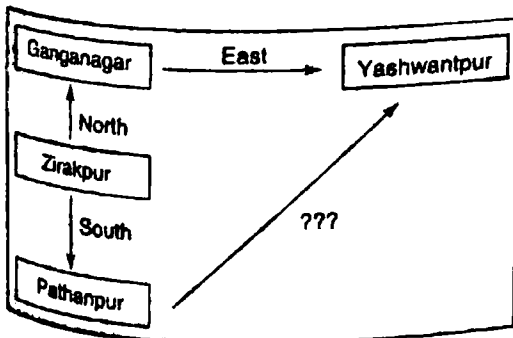
The answer can be clearly seen in the table we have made on previous page.

The correct answer is B.

191. Yashwantpur is to the east of Ganganagar, which is north of Zirakpur. If Pathanpur is to the south of Zirakpur, then in which direction from Pathanpur is Yashwantpur?

(A) North  
(B) South-east  
(C) North-east  
(D) West  
(E) South-west

It would be easiest if you represent the information in the question pictorially:



As is clear from the image, Yashwantpur is in the north-east from Pathanpur.

The correct answer is C.

192. If  $\times$  stands for 'addition',  $-$  stands for 'subtraction',  $+$  stands for 'multiplication' and  $\div$  stands for 'division', then  $40 \times 16 \div 16 - 8 + 10 = ?$

(A) 5  
(B) 24  
(C) 25  
(D) 36  
(E) 80

Changing the correct signs, the equation becomes:

$$40 + 16 - 16 \div 8 \times 10 = ?$$

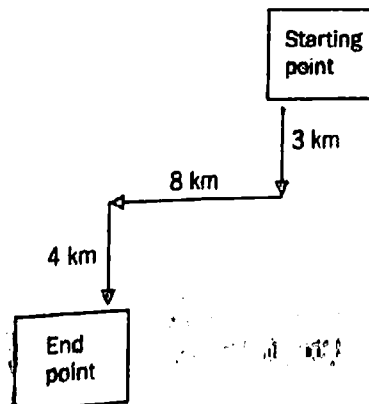
$$\text{or, } 56 - 20 = ?$$

$$\text{or, } ? = 36$$

The correct answer is D.

193. A man walks 3 km South and then turns to the right. After walking 8 km he turns to the left and walks 4 km. Then he takes a  $180^\circ$  turn. In which direction from the starting place is he now standing?

(A) West  
(B) South  
(C) North-east  
(D) South-west  
(E) South-east



The correct answer is D.

194. Kamal starts walking from his home one morning at 10, and walks in a straight line for 1 hour. All this while, his shadow was falling on his left. At the end of his walk, Kamal turned  $90^\circ$  in the anti-clockwise direction. Which direction is Kamal facing now?

(A) North

- (B) South
- (C) East
- (D) West
- (E) South-west

In the morning hours, if your shadow falls to your left, you are walking north. Thus, Kamal is walking north. Towards the end, he turns anti-clockwise  $90^\circ$ , that is, he turns to the left. Thus, he is now facing west.

The correct answer is D.

195. Raghav and Arvind, two brothers, were playing in an open ground. While playing, they followed certain paths described below, each of them starting from the same initial point. **(Real NMAT Question)**

Raghav started walking towards the north for 50 metres, then turned to his right and walked for 80 metres, after which he turned to his left and walked for 20 metres.

Arvind started walking towards the west for 30 metres and then turned to his right and proceeded for 40 metres.

Identify the direction of Raghav with respect to Arvind.

- (A) North-east
- (B) North-west
- (C) South-east
- (D) South-west
- (E) Cannot be determined

Let the origin be their starting point.

Position of Raghav = North 50 m + East 80 m (as turned to right) + North 20 m (as turned left)  
= North 70 m + East 80 m  
= North-east

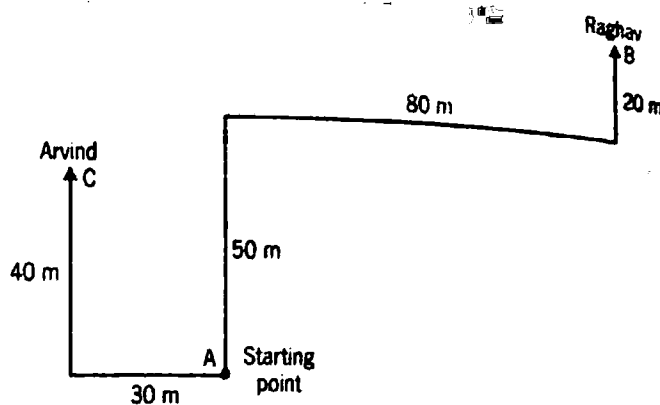
Position of Arvind = West 30 m + North 40 m (as turned to right)  
= North-west

If we want to know the position of Raghav with respect to Arvind, we should consider Arvind at the original point and then find the position of Raghav.

If Arvind is at the original point,

Then position of Raghav is = North  $(70 - 30)$  m + East  $(30 + 80)$  m = North 40 m + East 110 m  
= North-east

Here, A is the starting point whereas B and C are Raghav and Arvind's final positions.



Therefore, Raghav is in the North-east with respect to Arvind.

The correct answer is A.

196. Study the matrices and determine the digits that comprise the given word. **(Real NMAT Question)**

	0	1	2	3	4
0	M	N	O	P	Z
1	Q	J	G	E	D
2	P	I	R	G	S
3	F	N	B	W	V
4	M	Y	U	I	O

	5	6	7	8	9
5	S	R	P	B	A
6	W	K	L	V	C
7	I	F	H	E	S
8	O	J	P	E	I
9	B	H	S	K	M

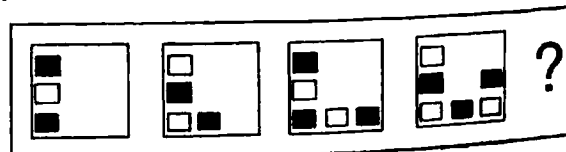
POISE

- (A) 03, 85, 43, 87, 78
- (B) 03, 85, 89, 24, 32
- (C) 20, 02, 75, 79, 13
- (D) 57, 10, 89, 97, 88
- (E) 87, 44, 21, 55, 77

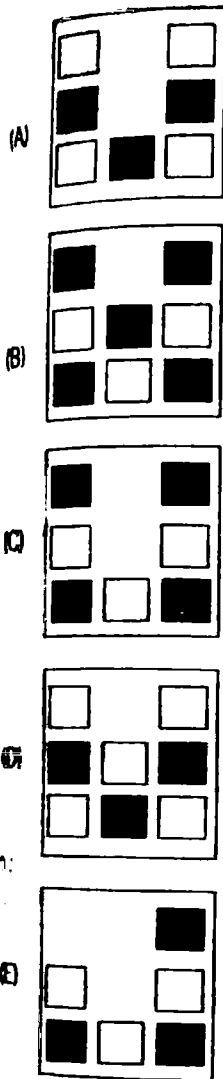
Option C has the correct coordinates for each letter as it appears in the word. In all the other options, some of the letters don't match with the numbers.

The correct answer is C.

- 197.



Which of the following should be the next figure in the above series?



In every successive figure, the number of small squares increases by one. Also, in every successive figure all the squares invert their shades—the white ones become black and the black ones become white.

The correct answer is C.

Proponents of law that require drivers to wear seat belts argue that in a democracy, one is allowed to take risk as long as the risk is limited to oneself, and no harm is done to the others as a result of the risk taking. They, therefore, conclude that wearing a seat belt or not cannot be left upon the individual to decide. (Real NMAT Question)

Which of the following, if true, would most seriously strengthen the conclusion drawn above?

- (A) Seat belts are mandatory even in an airplane.
- (B) The number of passengers who do not wear seat belts is higher in comparison to those who do wear seat belts.

- (C) Technological advancements will see cars with automatic seat belt fasteners taking care of people who do not wear their seat belts.
- (D) Insurance rates for all the automobile owners is more because of their need to pay for increased injuries or deaths of people caused by accidents.
- (E) The percentage of fatalities, in places that do not have a law that makes the wearing of seat belts compulsory, is higher in comparison to places with such a law.

The only statement that is strengthening the given statement is E.

A, B, C and D are merely statements. None of them is doing anything to either strengthen or weaken the conclusion that seat belts are mandatory and it cannot be left to individuals to decide whether they can wear them or not.

The correct answer is E.

199. Aarushi is an incompetent software engineer. During her four years of career at 'X' Technologies, she has been involved only in four projects.

(Real NMAT Question)

Which of the following statements, if true, would most weaken the above argument?

- (A) 'X' Technologies has taken on more than 10 projects in the past four years.
- (B) Her manager doesn't like her personally and that is why she doesn't involve her in projects.
- (C) Aarushi has been out of the country for various trainings and thus could not involve herself in more projects.
- (D) Aarushi is a specialist software engineer with high troubleshooting skills, and that is why she is chosen for select high-risk and high-stakes projects.
- (E) Aarushi takes five times longer than any other employee to complete a task and that is why her involvement in numerous projects was impossible.

Only D weakens the argument in the statement as it is clear from this statement that Arushi has competence in some areas and has been selected by her employer to take on more challenging jobs.

The correct answer is D.

**Directions for Questions 200–203:** Read the below information and answer the questions that follow on the basis of this information.

Nine people, Richard, Emmanuel, Luke, Andre, Patrick, Ethan, Jason, Shane and Joshua, stay on different floors of a 9-storey building. All of them own one car each, and each car is of a different colour: blue, white, grey, black, green, yellow, orange, red and pink, not necessarily in that order. The ground floor is numbered 1 and the topmost floor is numbered 9.

- Shane owns a black coloured car and stays on an even numbered floor. Richard stays on any even numbered floor below the floor on which Shane stays. The person who owns the orange coloured car stays on the fourth floor.
- Patrick stays on the second floor and owns the white coloured car. The person who owns a pink coloured car stays on the third floor. Richard does not own a green coloured car. There are two floors between the floors on which the people owning the red and the black coloured cars stay.
- Luke owns a grey coloured car. There are three floors between the floors on which Luke and Jason stay. Andre stays on a floor immediately above Joshua's floor. There is one floor between the floors on which Ethan and Jason stay.
- Ethan does not own the pink coloured car and does not stay on the ground floor. The person who owns the blue car stays on the top-most floor.

**200.** Who stays on floor number 8?

- (A) Emmanuel  
(B) Andre  
(C) Richard  
(D) Ethan  
(E) Shane

The final arrangement will look like this:

Floor	Person	Car colour
9	Emmanuel	Blue
8	Shane	Black
7	Ethan	Green
6	Richard	Yellow
5	Jason	Red
4	Andre	Orange
3	Joshua	Pink
2	Patrick	White
1	Luke	Grey

**The correct answer is E.**

**201.** How many persons are staying between Jason and Emmanuel?

- (A) Three  
(B) Four  
(C) Two  
(D) One  
(E) None of these

Check explanation to Q 200

**The correct answer is A.**

**202.** Who stays on the floor immediately below Joshua's floor?

- (A) Ethan  
(B) Andre  
(C) Patrick  
(D) Richard  
(E) Emmanuel or Luke

Check explanation to Q 200

**The correct answer is C.**

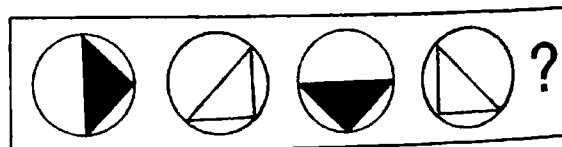
**203.** Who owns the yellow coloured car?

- (A) Andre  
(B) Ethan  
(C) Emmanuel  
(D) Richard  
(E) Luke

Check explanation to Q 200

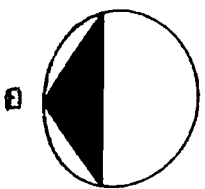
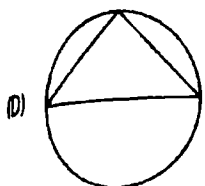
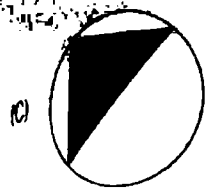
**The correct answer is D.**

**204.**



Which of the following should be the next figure in the above series?

- (A)
- (B)



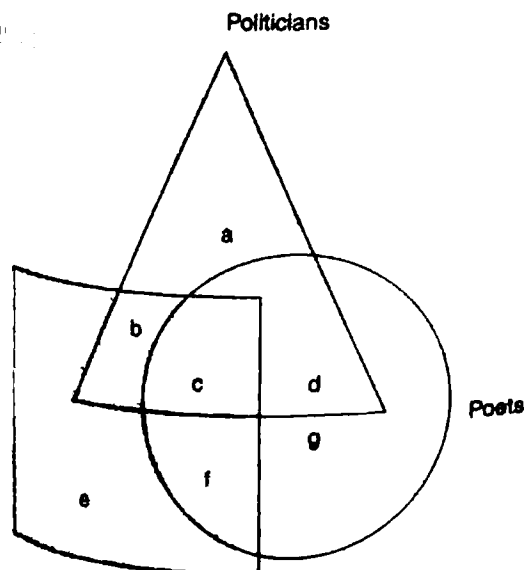
Every subsequent figure moves,  $45^\circ$  in the clockwise direction. Also the triangles invert colours from black to white in every subsequent figure.

The correct answer is E.

205. The triangle represents Politicians, the square represents Actors and the circle represents Poets. Which one of the following areas represents Politicians who are Poets but not Actors?

(Real NMAT Question)

- (A) a  
(B) b  
(C) c  
(D) d  
(E) e



D is the correct answer as this is the portion of the diagram where only the circle and the triangle overlap.

The correct answer is D.

206. In a family of six members, there is an equal number of males and females. C is the father of A and F while A is the granddaughter of B. E is the mother of C. D is another member in the family. There are two married couples in the family.

(Real NMAT Question)

Which of the following is the list of male members in the family?

- (A) BCD  
(B) BCE  
(C) BCF  
(D) CDE  
(E) CDF

If C is the father of A and F, and A is the granddaughter of B, then this implies that B is either the grandfather or the grandmother of A and F.

Given that E is the mother of C, it implies that E is the grandmother of A and F, thus B is the grandfather.

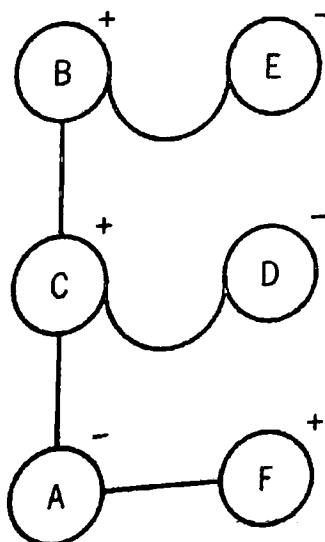
Since D is another member in the family and there are two married couples in the family.

So we have:

B and E (GF and GM of A and F) being the first married couple of the family.

C and D as the second married couple in the family C is the father (given) and D is the mother.

So we now have the three females in the family E, D and A. Thus B, C and F are the male members.



Here the sign '+' indicates a male member while the '-' sign indicates a female member.

Therefore, the list of the male members in the family is BCF.

The correct answer is C.

207. Study the matrices and determine the digits that comprise the given word. (Real NMAT Question)

	0	1	2	3	4
0	D	N	O	L	Z
1	M	R	B	E	U
2	U	S	A	P	M
3	Q	C	F	D	O
4	E	K	N	G	L

	5	6	7	8	9
5	E	O	B	N	H
6	Z	Y	R	J	D
7	A	C	U	F	A
8	J	W	S	H	G
9	U	N	Q	E	B

### UNANNOUNCED

- (A) 14, 01, 22, 01, 01, 55, 33, 97, 76, 55, 69  
 (B) 14, 42, 22, 96, 58, 56, 24, 01, 76, 55, 69  
 (C) 20, 58, 79, 96, 01, 34, 95, 89, 76, 55, 69  
 (D) 77, 01, 75, 42, 58, 56, 20, 96, 31, 98, 00  
 (E) 77, 58, 75, 96, 58, 57, 55, 01, 31, 98, 00

Option D has the correct coordinates for each letter as it appears in the word. In all the other options, some of the letters don't match with the numbers.

The correct answer is D.

208. Assam produces nearly 95% of the tea leaves in India, out of which almost 50% of the tea leaves are of Quality-X. The price of Quality-X tea leaves is 15 times more in the export market than in the domestic market. Some tea leaves are of Quality-Y and are sold in the domestic market. A small proportion of Quality-X tea leaves is used in India; the rest is exported. (Real NMAT Question)

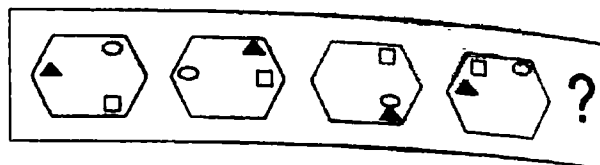
Which of the following statements can be inferred from the information given above?

- (A) Indians do not like Quality-X tea leaves.  
 (B) Quality-X tea leaves are preferred in export.  
 (C) India should not export Quality-X tea leaves.  
 (D) More than 50% of Quality-X tea leaves are exported.  
 (E) Tea leaves produced in India are only of two qualities.

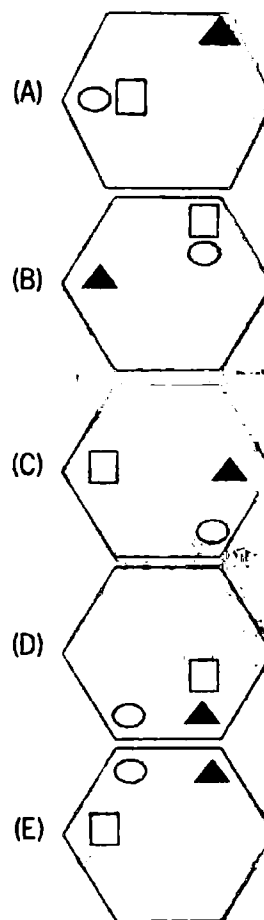
Option B is the best inference—the rest cannot be inferred as they are either extreme inferences or outside the scope of the argument.

The correct answer is B.

209.



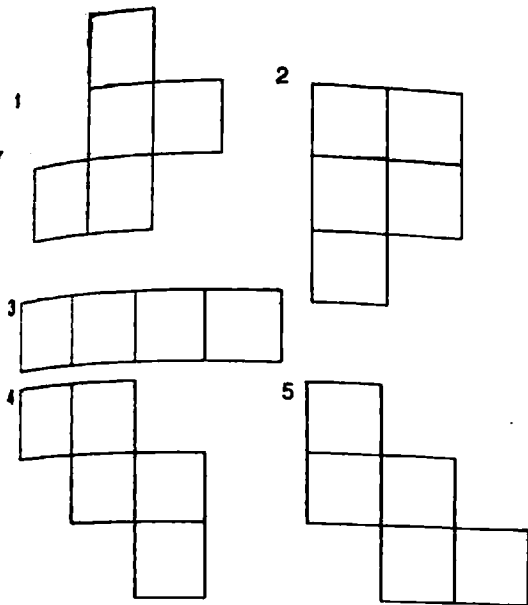
Which of the following should be the next figure in the above series?



The given figure is a hexagon. In every step, the triangle moves by two places, the circle by 4 places and the square by 5 places, all in the clockwise direction. Thus, the next figure should be (A).

The correct answer is A.

210. Which figure cannot be folded to form a cube-shaped box with an open top? (Real NMAT Question)

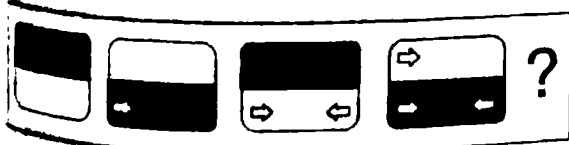


- (A) 2 only  
(B) 3 only  
(C) 2 and 3 only  
(D) 2, 3 and 4 only  
(E) 2, 3 and 5 only

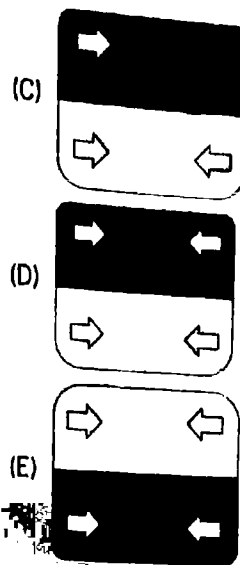
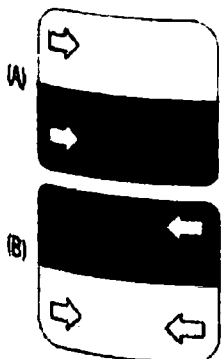
As a cube has 6 faces and we have to make a cube-shaped box with an open top. In figures 1, 4 and 5 it is possible to fold the given 5 faces such that it becomes an open-top cube. But, in Figures 2 and 3 it cannot be done.

The correct answer is C.

211.



Which of the following should be the next figure in the above series?



Note that the placement of the black half alternates between top and bottom in subsequent images. Also the number of arrows in each subsequent figure increases by one. The next figure should be (D).

The correct answer is D.

212. There were different types of dishes that were laid out on the table including a couple of sweet dishes. Mr X was seen avoiding the sweet dishes despite many others making a beeline for a second helping. The hostess even overheard Mr X asking a caterer if the lemonade being served was sweetened.

Which of the following is a good inference by the hostess?

- (A) Mr X likes it when he is served sweet dishes.  
(B) Mr X is either diabetic or health conscious.  
(C) Mr X dislikes the cook who made the sweet dishes.  
(D) Mr X likes to have sweets either with his wife or from his wife.  
(E) Mr X prefers sweets at afternoon meals and prefers mild sweets.

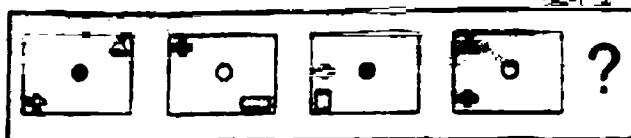
Mr X is avoiding sweet dishes while others are not and he even asked whether the lemonade being served was sweetened. Both these show that Mr X does not want to consume sugar—he may be diabetic or health conscious. So, statement B can be inferred.

The other options are all either outside the scope of the argument or extreme inferences.

The correct answer is B.



213.



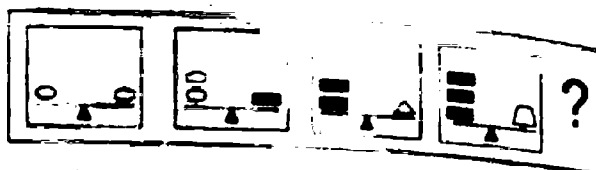
Which of the following should be the next figure in the above series?

- (A)
- (B)
- (C)
- (D)
- (E)

Divide the entire figure into three columns. The middle column always has the octagon, whose colour keeps alternating between black and white. So, the next figure should have a black octagon. The left column has the plus sign whose position keeps changing in this manner – top, middle, bottom, top, middle, bottom and so on. So, the next image should have the plus sign on top. The right column is where things get interesting. This figure changes shape in the following manner – triangle, rectangle, cylinder, triangle, rectangle, cylinder and so on. Also this shape appears at the four corners of the given square in the clockwise manner. So, the next image should have a rectangle in the top right corner of the square. Thus, (E) is the correct answer.

The correct answer is E.

214.



Which of the following should be the next figure in the above series?

- (A)
- (B)
- (C)
- (D)
- (E)

If you start looking for a pattern among the images you will get confused. This question is actually one of balancing. If you look closely, the black triangle with a horizontal line above it even looks like a weighing scale. Here is what we know from the first 4 images.

1 oval = 1 oval

2 ovals = 1 rectangle

2 rectangles = 1 triangle

3 rectangles = 1 trapezoid

In the correct answer, the above relationships will have to be maintained. (B) is the only option that does this and should be the correct answer.

The correct answer is B.

215. What is the value of  $(A + B + C + D)$  in the matrix given below? (Real NMAT Question)

10						
20	A					
30	B	C				
40	90	80	70			
50	100	D	80	70		
60	50	40	30	20	10	

- (A) 260  
(B) 270  
(C) 290  
(D) 300  
(E) 310

The second column is actually the addition of a constant from the first column and the first row value.

Thus,  $90 = 40 + 50$  and  $100 = 50 + 50$ . So,  $A = 20 + 50$  and  $B = 30 + 50$ .

Similarly, in the third column, the constant is 40.

Thus  $C = 30 + 40$ ; the next number is  $40 + 40$ ;  $D = 50 + 40$ .

So,  $A + B + C + D = 70 + 80 + 70 + 90 = 310$ .

The correct answer is E.

Directions for Questions 216–219: A machine processed the following input according to a certain rule to reach a final output. (Real NMAT Question)

Input: 32, panorama, 48, casualty, 23, wide, 4, nation, routine

Step I: casualty, 32, panorama, 48, 23, wide, nation, routine, 4

Step II: casualty, nation, 32, panorama, 48, wide, routine, 4, 23

Step III: casualty, nation, panorama, 48, wide, routine, 4, 23, 32

Step IV: casualty, nation, panorama, routine, wide, 4, 23, 32, 48

Step IV is the final output.

A new input is processed by the machine on the basis of the same rule.

New Input: 29, zoo, 36, yeast, 9, prices, 16, manoeuvre, toxicity

216. Which of the following will be Step II for the new input?

- (A) manoeuvre, 29, zoo, 36, yeast, prices, 16, toxicity, 9  
(B) manoeuvre, prices, 29, zoo, 36, yeast, toxicity, 9, 16  
(C) manoeuvre, prices, 29, zoo, 36, yeast, toxicity, 16, 9  
(D) manoeuvre, 29, zoo, 36, yeast, prices, toxicity, 9, 16  
(E) manoeuvre, prices, zoo, 36, yeast, toxicity, 29, 16, 9

The words are being arranged in increasing alphabetical order, one at a time, and simultaneously, the numbers are being pushed to the end, in increasing order, one at a time.

Input: 29, zoo, 36, yeast, 9, prices, 16, manoeuvre, toxicity

Step I: manoeuvre, 29, zoo, 36, yeast, prices, 16, toxicity, 9

Step II: manoeuvre, prices, 29, zoo, 36, yeast, toxicity, 9, 16

Step III: manoeuvre, prices, toxicity, zoo, 36, yeast, 9, 16, 29

Step IV: manoeuvre, prices, toxicity, yeast, zoo, 9, 16, 29, 36

The correct answer is B.

217. Which of the following will be the final output for the new input?

- (A) Step III  
(B) Step IV  
(C) Step V  
(D) Step VI  
(E) Step VII

From the explanation provided in Q. 216, the answer can be easily arrived at as B.

The correct answer is B.

218. Which will be the correct sequence of numbers from left to right in Step III of the new input?

- (A) 36, 16, 9, 29  
(B) 36, 9, 16, 29  
(C) 29, 36, 9, 16  
(D) 36, 29, 9, 16  
(E) 9, 16, 36, 29

From the explanation for Q. 216, the answer can be easily arrived at as B.

The correct answer is B.

219. Which of the following is Step-II in reverse order for the new input?

- (A) 9, 16, toxicity, yeast, 36, zoo, 29, manoeuvre, prices  
(B) 29, 36, yeast, toxicity, 16, 9, zoo, manoeuvre, prices  
(C) 16, 9, yeast, toxicity, 36, 29, zoo, prices, manoeuvre  
(D) 9, 16, manoeuvre, prices, 29, zoo, 36, yeast, toxicity  
(E) 16, 9, toxicity, yeast, 36, zoo, 29, prices, manoeuvre

From the table we made for Q. 216, the answer can be easily arrived at as E.

The correct answer is E.

220. Study the matrices and determine the digits that comprise the given word. (Real NMAT Question)

	0	1	2	3	4
0	R	M	W	R	I
1	F	K	A	F	O
2	K	P	F	K	T
3	K	L	F	G	T
4	C	E	G	I	L

	5	6	7	8	9
5	V	C	D	E	H
6	J	N	Q	S	U
7	V	X	Y	Z	A
8	B	D	H	J	M
9	N	O	P	Q	S

## INDIA

- (A) 43 95 86 34 14  
(B) 40 66 75 04 12  
(C) 40 59 75 43 12  
(D) 04 66 57 43 12  
(E) 34 59 68 43 14

Option C has the correct coordinates for each letter as it appears in the word. In all the other options, some of the letters don't match with the numbers.

The correct answer is C.

**Directions for Questions 221–224:** A machine rearranges some numbers based on a certain rule. The following arrangement illustrates the pattern of steps that the machine follows. Step V is the final output. (Real NMAT Question)

Input: 45, 18, 13, 29, 46, 41, 43, 16, 33, 11

Step I: 11, 45, 18, 13, 29, 46, 41, 43, 33, 16

Step II: 11, 13, 45, 29, 46, 41, 43, 33, 16, 18

Step III: 11, 13, 29, 45, 46, 41, 43, 16, 18, 33

Step IV: 11, 13, 29, 41, 46, 43, 16, 18, 33, 45

Step V: 11, 13, 29, 41, 43, 16, 18, 33, 45, 46

Answer the question that follows assuming that the new input given below is processed by the machine in the same manner.

New Input: 23, 21, 7, 14, 17, 25, 19, 38, 27, 13

221. Which will be the third number from the right in Step III for the new input?

- (A) 13  
(B) 14  
(C) 17  
(D) 19  
(E) 21

The prime numbers move to the front in increasing order and are arranged left to right. Non-prime numbers move to the end in increasing order and are arranged from left to right.

Input: 23, 21, 7, 14, 17, 25, 19, 38, 27, 13

Step I: 7, 23, 21, 17, 25, 19, 38, 27, 13, 14

Step II: 7, 13, 23, 17, 25, 19, 38, 27, 14, 21

Step III: 7, 13, 17, 23, 19, 38, 27, 14, 21, 25

The correct answer is B.

222. Which of the following will be the final step for the new input?

- (A) Step III  
(B) Step IV  
(C) Step V  
(D) Step VI  
(E) Step VII

The prime numbers move to the front in increasing order and are arranged left to right. Non-prime numbers move to the end in increasing order and are arranged from left to right.

Input: 23, 21, 7, 14, 17, 25, 19, 38, 27, 13

Step I: 7, 23, 21, 17, 25, 19, 38, 27, 13, 14

Step II: 7, 13, 23, 17, 25, 19, 38, 27, 14, 21

Step III: 7, 13, 17, 23, 19, 38, 27, 14, 21, 25

Step IV: 7, 13, 17, 19, 23, 38, 14, 21, 25, 27

Step V: 7, 13, 17, 19, 23, 14, 21, 25, 27, 38

The correct answer is C.

223. The positions of which of the following numbers remain unchanged from Step II to Step V?

- (A) Only 7
- (B) 7 and 13
- (C) 7, 13 and 14
- (D) 7, 13 and 21
- (E) 7, 13 and 38

The prime numbers move to the front in increasing order and are arranged left to right. Non-prime numbers move to the end in increasing order and are arranged from left to right.

Input: 23, 21, 7, 14, 17, 25, 19, 38, 27, 13

Step I: 7, 23, 21, 17, 25, 19, 38, 27, 13, 14

Step II: 7, 13, 23, 17, 25, 19, 38, 27, 14, 21

Step III: 7, 13, 17, 23, 19, 38, 27, 14, 21, 25

Step IV: 7, 13, 17, 19, 23, 38, 14, 21, 25, 27

Step V: 7, 13, 17, 19, 23, 14, 21, 25, 27, 38

The numbers whose positions remain unchanged are 7 and 13.

The correct answer is B.

224. What would be the final step of the new input, in reverse order, and then subtracting 1 from every alternate number starting from the first?

- (A) 6, 17, 12, 19, 22, 14, 20, 25, 26, 38
- (B) 38, 26, 25, 20, 14, 22, 19, 16, 13, 6
- (C) 37, 26, 24, 20, 13, 6, 12, 16, 18, 22
- (D) 37, 27, 24, 21, 13, 23, 18, 17, 12, 7
- (E) 7, 17, 13, 19, 23, 14, 21, 25, 27, 38

The prime numbers move to the front in increasing order and are arranged left to right. Non-prime numbers move to the end in increasing order and are arranged from left to right.

The final step is 7, 13, 17, 19, 23, 14, 21, 25, 27, 38.

The reverse would be 38, 27, 25, 21, 14, 23, 19, 17, 13, 7.

The correct answer is D.

225. The Government has appointed bureaucrats and politicians as heads of various sports institutions. As they do not have the necessary understanding of the sports that is mandatory for the effective functioning of these institutions, they have made some wrong decisions. (Real NMAT Question)

Which of the following statements can be concluded from the information given above?

- (A) Bureaucrats can become the heads of sports institutions, but not politicians.
- (B) All bureaucrats and politicians are responsible for the wrong decisions made.
- (C) The Government should replace all bureaucrats and politicians with new faces.
- (D) The heads of different sports institutions should be persons who are involved in the sport.
- (E) The Government is not making the right decisions and should be changed immediately.

Only D can be derived. The fact that they do not have the necessary understanding of the sport means that they are not from a sporting background but need to be.

Option A cannot be concluded as we are told that both bureaucrats and politicians have been appointed.

Option B cannot be concluded as, while it is clear they have made some wrong decisions, it is not clear that they are responsible for all the wrong decisions made.

Option C is an opinion and cannot be concluded from the given information.

Option E is also an opinion and cannot be concluded from the given information.

The correct answer is D.

226. Petroleum and its by-products such as petrol and diesel cause a lot of pollution and increase our carbon footprint. Over the last few years, petrol and diesel have been replacing other non-renewable fuels thereby polluting the atmosphere and as a result, affecting health. The condition is particularly bad in cities like Delhi and Mumbai.

(Real NMAT Question)

Which of the following weakens the argument?

- (A) Petrol causes less pollution as compared to diesel.
- (B) Petrol and diesel have been replacing fuels like coal, which are even more dangerous.
- (C) Petrol and diesel virtually run our economy. Without these fuels, we would be back in prehistoric ages.
- (D) The use of solar energy has severe limitations and hence cannot replace non-renewable fuels like petrol.
- (E) Indian companies are adopting new technologies to reduce pollution and selling carbon credits in the international market.

To weaken the argument, we must show that the use of Petrol and Diesel instead of other sources is actually good for health. B does this best and should be the correct answer.

The correct answer is B.

Directions for Questions 227–230: Based on the information given below, solve the questions that follow. (Real NMAT Question)

A debating team of 5 students is to be selected from 3 boys (X, Y and Z) and 5 girls (P, Q, R, S and T). T and Y, R and S, and Q and T cannot be selected together in the team.

227. If X is selected as one of the only two boys in the team, and Z is not among them, then how many teams are possible?

(A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5

Since there are two boys, there have to be three girls. Of the girls, T cannot be there as Y and T cannot be together.

Of the rest, R and S cannot be together; hence, QRS is not possible.

Thus, the only two possibilities are:

XYPQR and XYPQS.

The correct answer is B.

228. In how many ways can a team be selected fulfilling all conditions, if X is always a part of that team?

(A) 5  
(B) 7  
(C) 8  
(D) 11  
(E) 15

The possibilities are:

1. XYZ + PQ
2. XYZ + PR
3. XYZ + PS
4. XYZ + QS
5. XYZ + QR
6. XY + PQS
7. XY + PQR
8. XZ + PQS
9. XZ + PQR

10. XZ + PRT

11. XZ + PST

The correct answer is D.

229. If Q and R are always in the team, then in how many ways can the team be selected?

(A) 2  
(B) 4  
(C) 6  
(D) 8  
(E) Cannot be determined

The combinations that are possible:

1. XYZ + RQ
2. XY + PQR
3. XZ + PQR
4. YZ + PQR

The correct answer is B.

230. Which of the following can be a feasible replacement for a member of an already selected team, satisfying all conditions?

(A) R in place of Q  
(B) Y in place of Z  
(C) Y in place of X  
(D) R in place of S  
(E) Q in place of S

By the process of elimination, R cannot be replaced with Q because if T is there, then Q and T cannot be together.

Similarly, Y cannot replace Z because if T is there, Y and T cannot be together.

Similarly Y cannot replace X.

R in place of S is possible because only one of the two can be there.

Q in place of S again cannot be possible if T is there as Q and T cannot be together.

Hence, only Option D works.

The correct answer is D.

231. Fill in the blank in the series: (Real NMAT Question)

2, 18, 84, \_\_, 630

(A) 122  
(B) 148  
(C) 194  
(D) 226  
(E) 260

$$n^2 + \sqrt{n}$$

$$n = 1, 4, 9, 16, 25$$

$$n^2 + \sqrt{n}, \text{ where } n = 1 = 2$$

$$n^2 + \sqrt{n}, \text{ where } n = 4 = 18$$

$$n^2 + \sqrt{n}, \text{ where } n = 9 = 84$$

$$n^2 + \sqrt{n}, \text{ where } n = 16 = 260$$

$$n^2 + \sqrt{n}, \text{ where } n = 25 = 630$$

The correct answer is E.

232. Study the matrices and determine the digits that comprise the given word. (Real NMAT Question)

	0	1	2	3	4
0	Q	E	F	Y	M
1	U	A	E	Z	Q
2	L	T	R	S	T
3	P	Q	O	T	I
4	M	W	P	M	J

	5	6	7	8	9
5	T	E	U	R	T
6	G	A	Q	D	R
7	F	S	Q	A	K
8	S	Q	I	Q	R
9	W	O	M	O	E

### TORQUE

- (A) 21, 96, 22, 98, 10, 56  
 (B) 33, 00, 69, 31, 57, 10  
 (C) 55, 98, 58, 14, 56, 12  
 (D) 59, 32, 89, 31, 57, 12  
 (E) 67, 32, 89, 00, 10, 99

Option D has the correct coordinates for each letter as it appears in the word. In all the other options, some of the letters don't match with the numbers.

The correct answer is D.

233. Mansi was well known for her courageous and hardworking nature, as well as for her selfless works of charity. (Real NMAT Question)

What can be logically concluded from the above statement?

- (A) Mansi is a very nice human being.  
 (B) If you don't do charity, you are not selfless.  
 (C) Those who are courageous and unselfish are well known.  
 (D) Mansi worked hard with both courage and a selfless attitude.  
 (E) Due to the charitable work that Mansi did, she became well known.

Of all the options, D is the best as it is implicit in the statement.

Option A is a personal judgment and, while it could be made, it depends on the individual making it.

Option B is not a conclusion from the statement about Mansi.

Option C cannot be concluded as 'well known' (famous) is being used in a different context than from the original statement.

Option E again uses 'well known' (famous) in a different context to that given in the passage.

The correct answer is D.

234. Answer the question below based on the following information. (Real NMAT Question)

- I. 'A × B' means 'A is the mother of B'.  
 II. 'A # B' means 'A is the sister of B'.  
 III. 'A + B' means 'A is the brother of B'.  
 IV. 'A - B' means 'A is the father of B'.

Which of the following means 'A is the cousin of B'?

- (A) A # C + B  
 (B) A + C # B  
 (C) A × C + B  
 (D) A - C # D × B  
 (E) None of the above

Option A means A is the sister of C who is the brother of B—they are not cousins but siblings.

Option B means A is the brother of C who is the sister of B—they are not cousins but siblings.

Option C means A is the mother of C who is the brother of B—A is the mother of B.

Option D means A is the father of C who is the sister of D, who is the mother of B. A is the grandfather of B.

The correct answer is E.

235. A is the mother of B. C is the father of D. E is the aunt of F. B is not the son of A. D is not the daughter of C. B, D and F are siblings. F is not the brother of B. How many male members are there in the family? (Real NMAT Question)

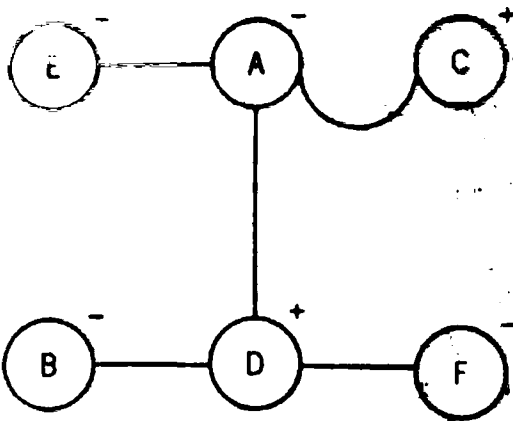
- (A) 1  
 (B) 2  
 (C) 3  
 (D) 4  
 (E) 5

Since F, B and D are siblings, their parents are A (mother) and C (father).

E is their aunt.

Further, F is a female as she is the sister of B, who is also a female as she is the daughter of A and D is the son.

Thus, there are two male members in the family—C and D.



Here the sign '+' indicates a male member while the sign '-' indicates a female member.

Therefore, there are two male members—C and D—in the family.

**The correct answer is B**

236. In a certain code language, time is called watch, watch is called strap, strap is called leather, leather is called animal, animal is called brown, brown is called biscuit, biscuit is called colour and colour is called time.

If the person wants to write 'The strap of the watch is brown in colour', then how will it be written in the code? (*Real NMAT Question*)

- (A) The brown of the strap is biscuit in time
- (B) The leather of the strap is biscuit in time
- (C) The watch of the strap is leather in time
- (D) The animal of the time is biscuit in watch
- (E) The brown of the leather is animal in time

In this given code language *the* = the (no code for this), *strap* = leather, *of* = of (no code for this), *the* = the (no code for it), *watch* = strap, *is* = is (no code for it), *brown* = biscuit, *in* = in (no code for it), *colour* = time.

Hence 'The strap of the watch is brown in colour' is written as 'The leather of the strap is biscuit in time'.

**The correct answer is B.**

237. A survey by a certain TV channel came up with results that were along expected lines. The viewers complained that all soaps felt the same, the soaps' formats had not changed in many years and that they were bored with the same storyline that each soap presented. (*Real NMAT Question*)

The TV producer was therefore right when he decided to:

- (A) bring in a variety of soaps for different age groups.
- (B) bring in new writers of soaps to provide variety.
- (C) introduce some new laughter-reality shows.
- (D) issue ultimatums to existing writers.
- (E) do all mentioned in A, B and C.

E is the best option. The format of soaps had not changed and viewers were bored—A, B and C address the issues.

One cannot give ultimatums to writers as writers are creative people and cannot be asked to write differently by force. Thus, D can be eliminated.

**The correct answer is E.**

238. If MAT = 20113 and FILE = 51296, then what is the code of TRUCK? (*Real NMAT Question*)

- (A) 113212108
- (B) 028131180
- (C) 110218013
- (D) 113211820
- (E) 121301800

If we look at the positions of the letters, M = 13, A = 1, T = 20, F = 6, I = 9, L = 12 and E = 5

MAT = 20113 and FILE = 51296, so we can conclude that the logic is, we are writing the position of letters in reverse order.

Code for TRUCK must be position of K, followed by that of C, then of U, then of R and finally of T.

Position of K = 11, Position of C = 3, Position of U = 21, Position of R = 18 and Position of T = 20

Code for TRUCK = 113211820

**The correct answer is D.**

239. Study the matrices and determine the digits that comprise the given word.

	0	1	2	3	4
0	M	B	Q	W	U
1	S	N	I	Z	B
2	O	T	U	J	A
3	R	E	C	H	T
4	B	T	E	I	S

	5	6	7	8	9
5	T	A	B	L	K
6	X	I	O	E	S
7	W	U	P	B	Q
8	I	T	T	V	M
9	S	E	B	F	U

**SUBSTITUTE**

- (A) 10, 04, 14, 44, 21, 12, 34, 23, 55, 42
- (B) 44, 99, 78, 69, 21, 43, 86, 77, 41, 31

- (C) 69, 22, 01, 95, 55, 85, 41, 99, 34, 96  
 (D) 69, 76, 97, 95, 41, 85, 88, 04, 21, 68  
 (E) 95, 99, 57, 10, 34, 66, 65, 76, 87, 96

Option C has the correct coordinates for each letter as it appears in the word. In all the other options, some of the letters don't match with the numbers.

The correct answer is C.

Questions 240–241 consist of a statement followed by two assumptions. You have to consider the statement and the two assumptions and decide which of the assumptions is implicit in the statement. Select from the following options:

- (A) Only I is an assumption  
 (B) Only II is an assumption  
 (C) Either I or II is an assumption  
 (D) Neither I nor II is an assumption  
 (E) Both I and II are assumptions

240. **Statement:** Strong communication skills cannot be the **only** criteria for becoming a successful entrepreneur, as has been exemplified in several recent entrepreneurial success stories.

**Assumption I** At least some entrepreneurs who have become successful recently do not have particularly strong communication skills.

**Assumption II** At least some entrepreneurs who have become successful recently have strong communication skills.

According to the statement, in several (but not all) recent entrepreneurial success stories, the entrepreneur did not have strong communication skills. This means that in some of these success stories the entrepreneur had strong communication skills and in some he or she did not. Thus, both the assumptions are implicit in the statement.

The correct answer is E.

241. **Statement:** Football needs physical skills and chess needs intellectual skills. Thus, Indian students should focus on playing chess.

**Assumption I** Playing chess is more lucrative than playing football.

**Assumption II** Indian students are better at intellectual pursuits than they are at physical pursuits.

The statement makes no mention of how much money can be made in either sport, so Assumption I is not implicit.

Assumption II, on the other hand, is clearly implicit in the statement.

The correct answer is B.

242. The mayor of Newtown is up for re-election in a month's time and is extremely apprehensive of his chances. According to a recent survey conducted by a news channel in Hampstead, Newtown's most populous suburb, more than 80 percent of the respondents stated that they would not vote for the current mayor.

The mayor's apprehensions are based on which of the following assumptions?

- (A) The people who were part of the survey will in no case change their mind.  
 (B) The opinion of the residents of Hampstead is a pretty accurate representation of the opinion of the residents of Newtown as a whole.  
 (C) The mayor was recently involved in a corruption scandal that received a lot of negative publicity in the print media.  
 (D) The mayor did not do enough to help the victims of the hurricane that struck Newtown last year.  
 (E) In the last three elections for the post of the mayor in Newtown, the incumbent mayor has never been re-elected to office.

The use of the word *survey* in the stimulus should give you a hint that you need to look for an error of representativeness in this question. The mayor's conclusion is based on the results of the survey but the survey was just conducted in Hampstead. What if the residents of Hampstead don't like the mayor for personal reasons? Then the residents of other localities might still vote for the mayor and the mayor could still win.

So, for the mayor to conclude that his chances are not very good, he has to assume that the survey in question was representative of the entire population of Newtown. B states this best and is the correct answer.

A lot of the options (C), (D), (E) provide additional negative points about the mayor but these are irrelevant to the argument at hand, since the evidence in the argument is the survey of voters.

- (A) The mayor's conclusion is based on the results of the survey. What happens after the survey (whether people change their mind or not) is irrelevant.  
 (B) The correct answer.  
 (C) This is not the reason why the mayor fears his chances.  
 (D) Same as (C).  
 (E) Same as (C).

The correct answer is B.



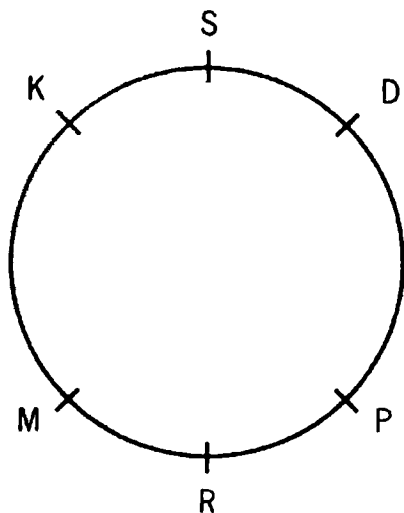
**Directions for Questions 243–246:** Read the below information and answer the questions that follow.

Six friends—S, R, P, D, M and K—are sitting around a circular sofa. S is sitting opposite to R. P is sitting to the right of R but left of D. M is sitting to the left of R. K is sitting to the right of S and left of M. Now, D and K interchange their positions and so do M and R.

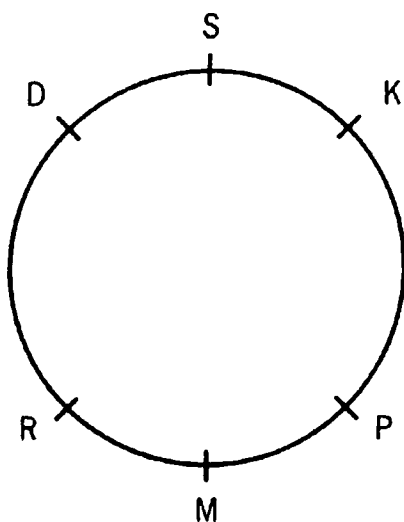
**243.** Who will be sitting second to the right of D?

- (A) S
- (B) M
- (C) R
- (D) P
- (E) K

The initial arrangement before interchange will look as follows:



Thus, the position after interchange will be as follows:



All the questions can now be easily answered.

**The correct answer is B.**

**244.** Four of the following five pairs are alike in a certain way based on their positions in the above arrangement and so form a group. Which of the following pairs do not belong to the group?

- (A) SR
- (B) DM
- (C) PS
- (D) KM
- (E) RP

All other pairs are arranged in an anti-clockwise direction.

**The correct answer is D.**

**245.** Who will be sitting opposite to S?

- (A) R
- (B) M
- (C) K
- (D) D
- (E) P

Check explanation to Q 243.

**The correct answer is B.**

**246.** Who will be sitting to the immediate left of K?

- (A) P
- (B) D
- (C) R
- (D) S
- (E) None of these

Check explanation to Q 243.

**The correct answer is A.**

**247.** Introducing Rajesh, Kavita said, 'His brother's father is the only son of my grandmother.' How is Rajesh related to Kavita?

- (A) Nephew
- (B) Son
- (C) Husband
- (D) Brother
- (E) Father

His brother's father is the same as Rajesh's father. If Rajesh's father is the only son of Kavita's grandmother, then Rajesh's father has to be Kavita's father as well.

**The correct answer is D.**

248. It is extremely unlikely that the incumbent governor will be voted back into office in the coming elections. According to a recent survey of residents of the state, more than 80% expressed dissatisfaction with the governor's performance and almost 60% stated that they would vote for the governor's opponent.

Which of the following most strongly supports the argument?

- (A) The views of most of the state's residents are in concordance with the views of the survey's respondents.
- (B) The governor has received a lot of bad publicity in the past owing to his involvement in a corruption scandal.
- (C) The survey only covered a small fraction of the state's populace.
- (D) The governor's opponent is very popular amongst the residents of the state.
- (E) The newspapers in the state are against the governor and favour his opponent instead.

The use of survey in the stimulus should give you a hint that you need to look for the issue of representativeness in this question. The argument assumes that the views of the people in the survey are representative of those in the state as a whole. (A) states this best and is the correct answer.

- (A) The correct answer
- (B) Even though this is negative information, this does not have any connection with our evidence and so is irrelevant. For all you know the bad publicity could be for the wrong reasons which the public may have later realised and so now it might want to vote for the incumbent governor.
- (C) This is the opposite of the correct answer. This raises doubts about the conclusion by suggesting that the evidence may not be representative in nature.
- (D) The popularity of the governor's opponent is not the question in the argument.
- (E) Same as (D), this is not the issue at hand.

The correct answer is A.

249. Study the matrices and determine the digits that comprise the given word.

	0	1	2	3	4
0	M	N	O	P	Z
1	Q	J	G	E	D
2	P	I	R	G	S
3	F	N	B	W	V
4	M	Y	U	I	O

	5	6	7	8	9
5	S	R	P	B	A
6	W	K	L	V	C
7	I	F	H	E	S
8	O	J	P	E	I
9	B	H	S	K	M

### FLOWER

- (A) 76 67 44 34 13 22
- (B) 30 67 02 65 78 56
- (C) 76 67 85 32 13 23
- (D) 30 67 86 65 88 56
- (E) 76 67 02 33 12 56

Option B has the correct coordinates for each letter as it appears in the word. In all the other options, some of the letters don't match with the numbers.

The correct answer is B.

Directions for Questions 250–253: Read the below information and answer the questions that follow.

In an exhibition, seven motorcycles—LML, Bajaj, Yamaha, Indian, Ducati, Harley, Triumph—are parked facing North in a straight line.

- (I) LML is to the immediate right of Bajaj
- (II) Yamaha is fourth to the left of Bajaj
- (III) Indian is between Ducati and Triumph
- (IV) Yamaha, which is third to the left of Ducati, is at one end

### General Explanation

Let us try to represent the given information pictorially:

LML is to the right of Bajaj. Let us assign random positions to both of these:

\_\_\_\_\_

B L

Yamaha is fourth to the left of Bajaj. Now, we can make adjustments to the above placement of Bajaj and LML in light of this information. Bajaj can either

be in positions five or six, and accordingly LML will be in positions six or seven.

Y Y B B/L L

Indian is right between Ducati and Triumph. This means that Ducati, Indian and Triumph have to be together, though we do not know which side of Indian will be Ducati and Triumph, respectively. The only way to fit in these three motorcycles is to put Yamaha in Position 1. Thus, this is what the order looks like:

Y   I   B   L   H

D/T D/T

Yamaha, which is third to the left of Ducati, is at one end. So, this is the final order of the motorcycles:

Y   I   D   B   L   H

All the questions can now be easily answered.

**250.** Which motorcycle is parked to the left of Ducati?

- (A) Bajaj
- (B) Harley
- (C) Triumph
- (D) Indian
- (E) Yamaha

The correct answer is D.

**251.** Which motorcycle is at the fourth position when moving from East to West?

- (A) Ducati
- (B) Harley
- (C) Indian
- (D) Triumph
- (E) Bajaj

The correct answer is A.

**252.** Which of the following is a correct statement?

- (A) Yamaha and LML are parked next to each other.
- (B) Harley is not parked at one end.
- (C) Indian is parked to the right of Ducati.
- (D) Triumph is between Yamaha and Indian.
- (E) Ducati and Harley have one motorcycle between them.

The correct answer is D.

**253.** Which of the following is an incorrect statement?

- (A) Harley is not parked at one of the ends.
- (B) Ducati is not parked to the right of Bajaj.
- (C) LML is not parked between Yamaha and Indian.
- (D) Ducati and Harley have exactly two motorcycles parked between them.
- (E) Indian is not parked in the centre of the group.

The correct answer is A.

Questions 254–255 contain two statements that are followed by two conclusions. You need to decide which of the given conclusions logically follows from the statements, disregarding commonly known facts. Select your choices from the following options:

- (A) Only Conclusion I follows
- (B) Only Conclusion II follows
- (C) Either Conclusion I or II follows
- (D) Neither Conclusion I nor II follows
- (E) Both Conclusions I and II follow

**254.** Statements: All rings are pods. Some pods are violets.

Conclusion I Some rings are violets.

Conclusion II All pods are rings.

We do not know whether the pods that overlap with violets also overlap with rings. These could be two separate groups for all we know. Thus, Conclusion I is not true.

Conclusion II can also not be inferred for the same reason as above. Thus, neither of the options can be concluded.

The correct answer is D.

**255.** Statements: Some crows are doves. All doves are sparrows.

Conclusion I Some crows are sparrows.

Conclusion II All crows are sparrows.

Since all doves are sparrows, some crows that are also doves must also be sparrows. So, Conclusion I is true. However, this does not imply that all crows are sparrows. So, Conclusion II is not true.

The correct answer is A.

**Direction for Questions 256–259:** Read the following information and answer the questions that follow.

Seven friends—P, T, M, J, V, R and W—are pursuing B.Com, B.A. and B.Sc courses. Three of them are pursuing B.Com,

Two are pursuing B.A. and two are pursuing B.Sc. Each of them has a favourite musical instrument ranging from Banjo, sitar, guitar, flute, violin, saxophone and tabla but not necessarily in the same order. None of those pursuing B.Com like either sitar or violin. M is pursuing B.A. and he likes Banjo. R is pursuing B.Sc and likes tabla. J is pursuing B.Com and likes guitar. P, who does not like sitar, is pursuing the same discipline as R. T is pursuing the same discipline as M. V does not like saxophone.

256. Who among the following is pursuing B.Com?

- (A) J, V and W
- (B) V, W and T
- (C) J, V and T
- (D) J, P and R
- (E) None of the above

We have to arrange 7 people on the basis of their course, name and musical instrument and so we need a table with 3 columns and 7 rows. We can fill data for M and R. Now, P must be doing B.Sc as he is doing the same course as R. Similarly, T is doing B.A. So, J, V and W are doing B.Com. Similarly, other points can also be analysed and filled in the table.

The final arrangement will look as follows:

Person	Course	Instrument
J	B.Com	Guitar
V	B.Com	Flute
W	B.Com	Saxophone
M	B.A.	Banjo
T	B.A.	Sitar
R	B.Sc.	Tabla
P	B.Sc.	Violin

The questions can now be easily answered.

The correct answer is A.

257. What is the favourite musical instrument of M?

- (A) Flute
- (B) Sitar
- (C) Guitar
- (D) Banjo
- (E) Saxophone

Check explanation for Q 256

The correct answer is D.

258. What are the favourite musical instruments of those who are pursuing B.Sc?

- (A) Guitar and Violin
- (B) Sitar and Tabla
- (C) Tabla and violin
- (D) Flute and sitar
- (E) Violin and saxophone

Check explanation for Q 256

The correct answer is C.

259. Which of the following combinations is correct?

- (A) J - B.A. - Guitar
- (B) M - B.Com - Banjo
- (C) T - B.A. - Tabla
- (D) T - B.Sc - Sitar
- (E) W - B.Com - Saxophone

Check explanation for Q 256

The correct answer is E.

260. In a certain code, PATNA is written as QZUMB. How will NEPAL be written in this code?

- (A) OFQZP
- (B) MDQZK
- (C) OFQZM
- (D) MFOBK
- (E) ODQZM

In this code, the letters at odd positions are replaced with the letter after them (P becomes Q, T becomes U and so on) and the letters at even positions are replaced with the letter before them (A becomes Z, N becomes M and so on).

The correct answer is E.

261. Prakash introduces Sunita as the daughter of the sister of his sister's mother. How is Sunita related to Prakash?

- (A) Aunt
- (B) Mother
- (C) Sister
- (D) Cousin
- (E) Daughter

Prakash's sister's mother will also be Prakash's mother. So, her sister becomes Prakash's aunt. Aunt's daughter is cousin.

The correct answer is D.

## 8.0 Past NMAT by GMAC™ Test Papers



## 8.1 Past NMAT by GMAC™ Test Paper—1

# Language Skills

passage for Questions 1–4: One of the most frightening and destructive phenomena of nature is a severe earthquake and its terrible after effects. Such earthquakes can trigger landslides, avalanches, fires, floods, volcanic eruptions and tsunamis. An earthquake, also known as a quake, tremor or temblor, is the result of an abrupt release of accumulated energy in the Earth's crust that creates seismic waves.

Sometimes the sliding plates in the Earth's outer layer get locked and are unable to release the accumulated energy. When this energy grows strong enough, the plates break free and release it in the Earth's crust. In the process, vibrations called "seismic waves" are generated. These vibrations cause portions of the earth to shake.

The British engineer John Michell was one of the first to give a scientific cause for earthquakes. In his memoirs in 1760 Michell wrote that earthquakes and the waves of energy that they make are caused by "shifting masses of rock miles below the surface". An earthquake's point of initial rupture is called its hypocentre. The epicentre is the point at ground level directly above the hypocentre.

Earthquakes beneath the ocean floor sometimes generate intense sea waves or tsunamis. These waves travel across oceans at high speeds and may be up to 15 metres high or higher when they reach the shore. Earthquakes are caused mostly by rupture of geological faults, but also by other events such as volcanic activity, landslides and human activities like coal mining, oil drilling and nuclear blasts.

It is estimated that there are 500,000 detectable earthquakes in the world each year, about 100 of them that end up causing damage. The magnitude of an earthquake, usually expressed by the Richter scale, is a measure of the amplitude of the seismic waves. The magnitude of an earthquake is a measure of the amount of energy released. It is also the most common scale on which earthquakes larger than around 5 are reported worldwide.

In addition to the magnitude and local geologic conditions, the factors which determine an earthquake's destructiveness include the focal depth, the distance from the epicentre, the design and construction of buildings and the density of population in the area. The devastating earthquake that struck Japan in March 2011 had a magnitude of 9.0. The largest earthquake that has been measured on a seismograph reached 9.5 magnitude, and had occurred in 1960. Its epicentre was near Cañete, Chile.

With the rapid growth of mega-cities such as Mexico City, Tokyo and Tehran, in areas of high seismic risk, some seismologists warn that a single quake may claim the lives of

up to 3 million people. Most natural hazards can be detected before they strike. However, science till now has failed to predict earthquakes. They come without warning and continue to kill. Luckily, earthquakes have some patterns. Sometimes foreshocks precede quakes, though they seem like minor quakes.

Seismologists are making and testing theories of earthquake prediction. Experimental forecasts are beginning to show success at pointing out impending seismicity. These scientific triumphs, however, are many years away from practical application.

- Which of the following is the best title for the passage?
  - Predicting earthquakes
  - The causes of earthquakes
  - Understanding natural disasters
  - The devastating effects of earthquakes
  - General information about earthquakes
- Which of the following is not mentioned in the passage as the cause of earthquakes?
  - Oil mining
  - Coal mining
  - Geological faults
  - The abrupt release of the accumulated energy
  - The speed of the sliding plates in the Earth's outer layer
- Which of the following statements is supported by the passage?
  - Adequate measures have been taken in cities like Mexico City, Tokyo and Tehran to protect the structures against potential hazards of earthquakes.
  - The distance from the epicentre is one of the important factors that can determine the destructiveness of the earthquake.
  - Seismologists' efforts to find ways to predict earthquakes will never succeed.
  - The Richter Scale cannot measure the earthquake of magnitude higher than 5.
  - Every year, the world witnesses 500,000 destructive earthquakes.



4. The author discusses the topic of predicting earthquakes in order to suggest that:
- (A) predicting earthquakes is difficult and the efforts towards developing a perfect system may never succeed.
  - (B) inadequate efforts are made to develop the warning system about the impending earthquakes.
  - (C) seismologists have achieved modest success in analysing the causes of the earthquakes.
  - (D) making a forecast about earthquakes is difficult but efforts are being made.
  - (E) until now, scientists have failed to predict natural disasters.

#### Passage for Questions 5–8

There was virtually no daily press when the First Amendment was written during Washington's presidency. The daily newspaper is largely the product of the mid-19<sup>th</sup> century; radio and television have been around since the first half of the 20<sup>th</sup> century. As recently as the presidency of Herbert Hoover (1929-1933), reporters submitted their questions to the President in writing and he responded in writing, if at all. As Hoover put it, 'The President of the United States will not stand and be questioned like a chicken thief by men whose names he does not even know.'

Hoover's successor, Franklin D. Roosevelt (1933-1945), practically invented media politics. To Roosevelt, the media was a potential ally. Roosevelt promised reporters two press conferences—presidential meetings with reporters—a week, resulting in about 1,000 press conferences in his 12 years in the White House. FDR was the first president to use the radio, broadcasting a series of reassuring 'fireside chats' to the Depression-ridden nation. Roosevelt's crafty use of radio helped him win four presidential elections. Theodore White tells the story of the time in 1944 when FDR found out that his opponent, Thomas E. Dewey, had purchased 15 minutes of air time on NBC immediately following his own address. Roosevelt spoke for 14 minutes and then left 1 minute silent. Thinking that the network had experienced technical difficulties, many listeners changed their dials before Dewey came on the air.

Another of Roosevelt's talents was knowing how to feed the right story to the right reporter. He used presidential wrath to warn reporters off material he did not want covered and he chastised news reports he deemed inaccurate. His wrath was rarely invoked, however, and the press revered him, never even reporting to the American public that the President was confined to a wheelchair. The idea that a political leader's private life might be public business was alien to journalists in FDR's day. The relatively cosy relationship between politicians and the press lasted through the early 1960s. ABC's Sam Donaldson has said that when

he first came to Washington in 1961, 'many reporters saw themselves as an extension of the government, accepting, with very little skepticism, what government officials told them.'

5. What is the central idea of the passage?
- (A) Defining the role of media in the political scenario
  - (B) Defining the role of the president during the Depression
  - (C) Understanding the stages of development of media politics
  - (D) Recognizing the importance of healthy skepticism on the part of the media
  - (E) Exploring how politicians controlled the media since the country's beginning
6. Which of the following facts suggests the idea that a political leader's private life might be public business was alien to journalists in FDR's day?
- (A) President Roosevelt's dependency on a wheelchair did not become public knowledge.
  - (B) Media persons during President Roosevelt's time considered themselves an extension of the government.
  - (C) A stable and healthy relationship between the media and politicians existed during President Roosevelt's term.
  - (D) President Roosevelt used his presidential wrath to chastise the material and news reports he deemed inaccurate.
  - (E) Though he addressed 1,000 press conferences in his 12 years in the White House, President Roosevelt never disclosed his personal life in them.
7. According to the author, what can be concluded from the passage?
- (A) Politicians control the media.
  - (B) The press has always been skeptical of political leaders.
  - (C) The media's role in politics has evolved through the presidencies.
  - (D) Effective use of the media is a pre-requisite for a successful political career in the US.
  - (E) The public recognised the talents of President Roosevelt because of the honest treatment by the press.

8. The author agrees with all of the following statements EXCEPT:
- (A) President Franklin D. Roosevelt considered the media a potential ally.
  - (B) Healthy relationships between politicians and the press never existed.
  - (C) Reporters never publicised the personal life of a politician in the early days.
  - (D) President Roosevelt's crafty use of radio helped him win four presidential elections.
  - (E) President Roosevelt controlled the media reporters and never let them publish any content he considered inaccurate.

9. Select the word that is nearly the opposite in meaning to the given word: *mellow*

- (A) aged
- (B) ugly
- (C) harsh
- (D) delicate
- (E) developed

10. Select the word or phrase that is nearly the opposite in meaning to the given word: *precise*

- (A) careless
- (B) inflexible
- (C) restricted
- (D) ambiguous
- (E) uncompromising

11. Select the word or phrase that is nearly the opposite in meaning to the given word: *pertinacity*

- (A) impatience
- (B) irrelevance
- (C) pliancy
- (D) rigidity
- (E) stubbornness

12. Select the word or phrase that is nearest in meaning to the given word: *obstreperous*

- (A) obstructive
- (B) noisy
- (C) energetic
- (D) disruptive
- (E) destructive

13. Select the word or phrase that is nearest in meaning to the given word: *gouge*

- (A) injure
- (B) extort
- (C) punch
- (D) compel
- (E) extricate

**Directions for Questions 14–17:** The following passage has blanks that have been numbered (1) to (4). From the given words, fill in the blanks with the most appropriate words.

The situation may be summed (1) by saying that a variety of forces are bringing (2) the destruction of the caste-based system of production in the villages and at the local level. (3) individual castes increasingly competing with each other (4) access to secular benefits, the conflict is only likely to become sharper.

14. (1)

- (A) up
- (B) in
- (C) at
- (D) about
- (E) around

15. (2)

- (A) alongside
- (B) across
- (C) about
- (D) up
- (E) in

16. (3)

- (A) Besides
- (B) Along
- (C) Beyond
- (D) Behind
- (E) With

17. (4)

- (A) by
- (B) with
- (C) in
- (D) at
- (E) for

**Directions for Questions 18–21:** Rearrange the jumbled sentences to show the appropriate sequence.

18. (A) He would have said, undoubtedly, that he had found a nation of poets.  
 (B) There was hardly any such thing as slang in his day, for no graphic trope was too virile or uncommon for acceptance, if its meaning were patent.  
 (C) If Shakespeare were to have come to Chicago and heard the man in the street, he'd have found himself more at home than in London.  
 (D) In the mouths of clerks, he'd have found English being used with all the freedom of unexpected metaphor, and the plastic, suggestive diction that used to be the privilege of the Elizabethan dramatists.  
 (E) His own heroes often spoke what corresponds to the slang of today.  
 (A) CADEB  
 (B) CDEBA  
 (C) CBDAE  
 (D) CEDBA  
 (E) CDABE
19. (A) For a while, his head spun when he saw the victim in a pool of blood.  
 (B) As soon as the victim was sent to the operating theatre, the duty doctor inside screamed in shock to see his only son on the operating table.  
 (C) A while later, he came to his senses, and called the ambulance.  
 (D) Jack was in a maddening hurry to catch the train when he witnessed the gory incident.  
 (E) What happened then was even more dramatic.  
 (A) ABCDE  
 (B) EADBC  
 (C) BECDA  
 (D) CABDE  
 (E) DACEB
20. (A) Nineteen fossilised teeth of *Paranthropus robustus* and *Australopithecus africanus* from caves in South Africa, when subjected to Strontium isotope analysis by researchers of the Max Planck Institute for Evolutionary Anthropology in Leipzig, revealed that females spent their early growth years away from

the caves where they were later found, strengthening the migration theory.

- (B) The origins of the patrilocal practice of women leaving their natal families/communities after marriage can thus be traced back to the time prior to the evolution of modern humans.  
 (C) The females seem to have travelled at least some distance to join a different group and mate with a male partner.  
 (D) A study of millions of years old enamel of fossilised teeth of hominids, the early ancestors of humans, reveals a pattern of female migration.  
 (A) ADCB  
 (B) DABC  
 (C) ACDB  
 (D) DACB  
 (E) ABCD
21. (A) There are some people who relate anger to upbringing or food intake.  
 (B) German researchers too found out that a certain strain of the gene caused more havoc than others.  
 (C) The strain was found to affect dopamine, a brain chemical that is linked to anger and aggression.  
 (D) However, the discovery and isolation of a certain gene explains why certain people fly into a rage.  
 (A) ACBD  
 (B) BDAC  
 (C) DBAC  
 (D) ADBC  
 (E) ABCD

**Directions for Questions 22–25:** In the given question, the sentence has four underlined words or phrases. Identify the one underlined word or phrase that must be changed in order to make the sentence correct. Mark (E) for no error.

22. The constellation Aquarius was associated with the rainy seasons by a large amount of ancient civilisations.  
 (A) associated  
 (B) rainy  
 (C) large

- (D) amount  
(E) No error

23. It is a common observation that many a man have resigned to fate.

- (A) a common  
(B) many a man  
(C) have resigned  
(D) to fate  
(E) No error

24. The third one-day match between India and New Zealand hadn't hardly begun when it started to rain.

- (A) between  
(B) hadn't  
(C) begun  
(D) to rain  
(E) No error

25. Although I have worked in this office for over two years, I am yet to find a person with who I feel comfortable.

- (A) Although  
(B) for  
(C) yet  
(D) who  
(E) No error

Directions for Questions 26–29: Choose the set of positions whose meaning and sequence best fits the 3 sentences.

26. (1) Clinton said that the new Afghan policy will be on hold \_\_\_\_\_ the new government in that country is in place.

(2) The results of the 20 August presidential elections are yet \_\_\_\_\_ be declared.

(3) \_\_\_\_\_ areas of bilateral cooperation, they also discussed issues related to counter-terrorism.

- (a) to  
(b) till  
(c) after  
(d) since  
(e) beyond  
(f) besides

- (A) baf  
(B) abd  
(C) abf  
(D) acf

- (E) acb

27. (1) The mysterious appearance \_\_\_\_\_ Rahul in Tihar led to much commotion in a cluster of 15-20 houses.

(2) A surprising finding has come about \_\_\_\_\_ the ingenuity, perseverance and international cooperation.

(3) \_\_\_\_\_ silicate bodies, such features are typically attributed to water and hydroxyl-bearing materials.

- (a) as  
(b) of  
(c) for  
(d) from  
(e) after  
(f) through

- (A) abc  
(B) bcd  
(C) abf  
(D) bfc  
(E) bda

28. (1) At the sound of the bell, the instructor asked the students to hand \_\_\_\_\_ their test papers.

(2) I am really surprised that you turned \_\_\_\_\_ an offer which other people would have jumped at.

(3) I shall always remain indebted \_\_\_\_\_ you for the help you gave me at a time when I was ignored by even my close relatives.

- (a) to  
(b) in  
(c) off  
(d) for  
(e) down  
(f) on

- (A) bca  
(B) bea  
(C) eca  
(D) fcd  
(E) fed

29. 1. He was so fed up \_\_\_\_\_ the complaints about the incorrect bills.
2. \_\_\_\_\_ such economic instability, it is time that the finance ministry puts in place some strict policies.
3. Even if you explain \_\_\_\_\_ your use of foul language, I will not be able to forgive you for it.
- (a) from  
(b) of  
(c) away  
(d) off  
(e) to  
(f) with
- (A) abc  
(B) bec  
(C) cdd  
(D) ede  
(E) ffc

**Directions for Questions 30–31:** Choose the word or set of words for each blank that best fits the meaning of the sentence as a whole.

30. The students displayed their \_\_\_\_\_ nature when asked to gather in the ground at the specified time, but were \_\_\_\_\_ with their demand for waiving the minimum attendance to be able to take the exam.
- (A) respect .....kind  
(B) obedient .....persistent  
(C) insincerity .....sarcastic  
(D) subservience .....towering  
(E) obsequiousness .....vigorous
31. But the dawn of the \_\_\_\_\_ of *Homo sapiens* is cloaked in mystery, and experts have long \_\_\_\_\_ over the matter.
- (A) ancestry, fought  
(B) heredity, clashed  
(C) lineage, puzzled  
(D) parentage, quarreled  
(E) pedigree, thought

32. Choose the word or pair of words that best completes the relationship to the given pair. Epistle : letter :: \_\_\_\_\_ : \_\_\_\_\_

- (A) elegy : depressed  
(B) epithet : depiction  
(C) epitaph : true  
(D) lyrics : writer  
(E) ode : poem

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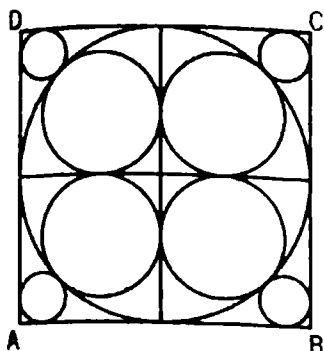
# Quantitative Skills

- At a nature trail camp, one-fifth of the total members went rock climbing; twice the square root of the total members went hiking up a mountain trail. The remaining 10 were exploring in caves. How many members went hiking?
  - 5
  - 10
  - 15
  - 20
  - 25
- 201 digits were used to number the pages of a book, starting from 1, find the number of pages in the book.
  - 100
  - 103
  - 105
  - 107
  - Cannot be determined
- Which of the following numbers is divisible by 9?
  - 1,203
  - 2,256
  - 42,651
  - 71,623
  - 92,423
- Two natural numbers,  $m$  and  $n$ , are such that their least common multiple is 300. How many pairs of these numbers ( $m$  and  $n$ ) are possible?
  - 37
  - 38
  - 70
  - 75
  - None of the above
- How many odd factors do  $8!$  have?
  - 3
  - 4
  - 7
  - 9
  - 12
- Which of the following is equivalent to  $\log \left( \frac{a^4}{\sqrt{b^3c}} \right)$ ?
  - $\log a - 2\log b$
  - $\frac{1}{3}\log a + \frac{1}{2}\log c$
  - $\log a - \log b$
  - $\frac{1}{2}\log a + \frac{1}{3}\log b - \log c$
  - $\frac{1}{2}\log a - \frac{1}{3}\log b + \log c$
- In a school, 600 students took a common entrance test. Out of those who took the test, 75% of girls and 60% of boys cleared the test. The total pass percentage of students clearing the test is 70%. How many boys attempted the test?
  - 100
  - 200
  - 250
  - 350
  - 500
- Vinay invested an equal amount of money in two bonds. After 2 years, he received a simple interest of Rs 600 from the first bond and a compound interest of Rs 606 from the second bond. If the rate of interest was the same for both the bonds, what was the total amount of money that Vinay had invested in the two bonds?
  - 15,000
  - 30,000
  - 60,000
  - 1,20,000
  - 2,40,000
- The capital of a company, Estyle, is made of 75,000 preferred shares with a dividend of 15% and 20,000 common shares, with the par value of each type of share at Rs 10. The total profit of Estyle was Rs 2,40,000 of which Rs. 40,000 was kept in a

reserve fund. The remaining profit was distributed to the shareholders. What would be the difference in the dividend percentage given to the common shareholders if the amount kept away in the reserve fund was reduced to Rs 25,000?

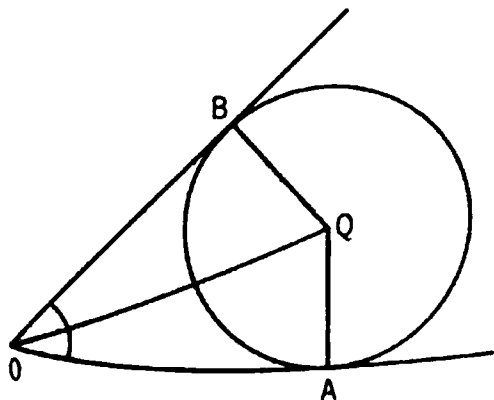
- (A) 5.75%  
(B) 7.5%  
(C) 10%  
(D) 12.75%  
(E) 15%
10. Find a number which when added to both terms of the ratio 17 : 23 makes it equal to 10 : 13 so that the difference between the terms of the first ratio and the difference between the terms of the second ratio remains the same?  
(A) 1  
(B) 3  
(C) 5  
(D) 6  
(E) 9
11. Swati had three cartons of books. The average price of the books in Carton 1 was Rs 64, the average price of the books in Carton 2 was Rs 82, and the average price of the books in Carton 3 was Rs 95. The average price of all the books in Carton 1 and Carton 2 together was Rs 78 and the average price of all the books in Carton 2 and Carton 3 together was Rs 90. What was the average price of the books in the three cartons?  
(A) Rs 68.37  
(B) Rs 75.21  
(C) Rs 87.43  
(D) Rs 90.25  
(E) Rs 92.24
12. FDB Builders was awarded the contract to construct a bridge. The company employed 100 workers to finish the work in 120 days. When four-fifths of the work was completed in 80 days, the company wanted to reduce the number of workers. How many workers can be let go without affecting the completion schedule of the construction of the bridge?  
(A) 25  
(B) 40  
(C) 50  
(D) 65  
(E) 75
13. A pump can be used for filling as well as emptying a tank. The capacity of the tank is 1,500 m<sup>3</sup>. The emptying capacity of the tank is 10 m<sup>3</sup> per minute higher than its filling capacity and the pump needs 5 minutes less to empty the tank than it needs to fill it. What is the emptying capacity of the tank?  
(A) 10 m<sup>3</sup> per minute  
(B) 30 m<sup>3</sup> per minute  
(C) 40 m<sup>3</sup> per minute  
(D) 50 m<sup>3</sup> per minute  
(E) 60 m<sup>3</sup> per minute
14. In a race, two wagons start off from the same point but travel in opposite directions. One travels at 80 mph. Two hours after starting, the wagons are 240 miles apart. What is the other wagon's speed in miles per hour?  
(A) 30 mph  
(B) 35 mph  
(C) 40 mph  
(D) 45 mph  
(E) 50 mph
15. If  $3a + \frac{1}{5a} = 3$ , then what is the value of  $25a^2 + \frac{1}{9a^2}$ ?  
(A)  $\frac{17}{3}$   
(B) 9  
(C)  $\frac{65}{3}$   
(D) 25  
(E)  $\frac{85}{3}$
16. What is the sum of the products:  $1 \times 2 \times 3$ ;  $2 \times 3 \times 4$ ; ...;  $50 \times 51 \times 52$ ?  
(A) 16,56,944  
(B) 17,56,944  
(C) 17,56,950  
(D) 17,56,964  
(E) 17,56,966
17. If  $\log_x a$ ,  $\log_y a$  and  $\log_z a$  are in H.P., then  $x$ ,  $y$  and  $z$  are in:  
(A) A.G.P.  
(B) A.P.  
(C) G.P.  
(D) H.P.  
(E) Cannot be determined.

18. What is the sum of the radius of the three types of circles given in the figure below, if the side of the square ABCD is 4 cm?



- (A)  $\frac{4\sqrt{2}-4}{\sqrt{2}+1}$  cm  
 (B)  $\frac{2\sqrt{2}+2}{\sqrt{2}+1}$  cm  
 (C)  $\frac{4\sqrt{2}+2}{\sqrt{2}+1}$  cm  
 (D)  $\frac{8\sqrt{2}+2}{\sqrt{2}+1}$  cm  
 (E)  $\frac{2\sqrt{2}+2}{\sqrt{2}-1}$  cm

19. In the figure below, Q is the centre of the circle.  $\angle AOB = 60^\circ$  and the radius of the circle is 14 inches. From O, OA and OB are the tangents drawn to the circle at A and B respectively. Find the area of the quadrilateral OAQB, in sq inches, not covered by the circle.



- (A)  $169\left(\sqrt{3} - \frac{\pi}{3}\right)$   
 (B)  $144\left(\pi - \frac{1}{2}\right)$

- (C)  $144\pi$   
 (D)  $196\left(\sqrt{2} + \frac{\pi}{\sqrt{3}}\right)$   
 (E)  $196\left(\pi + \frac{1}{\sqrt{2}}\right)$

20. Three equal circles of radius 2 cm intersect each other in such a way that each circle passes through the centres of the other two circles. Find the common area between the three circles.

- (A)  $(\pi - \sqrt{3})$   
 (B)  $1.5(\pi - \sqrt{3})$   
 (C)  $2(\pi - \sqrt{3})$   
 (D)  $2.5(\pi - \sqrt{3})$   
 (E)  $3(\pi - \sqrt{3})$

21. Find the equation of the line passing through (23, 2) and perpendicular to the line  $6x + y - 15 = 0$ .

- (A)  $6x + y - 140 = 0$   
 (B)  $6x - y - 136 = 0$   
 (C)  $6x + y + 15 = 0$   
 (D)  $x + 6y - 35 = 0$   
 (E)  $x - 6y - 11 = 0$

22. There are 12 holes made in the ground. At least 3 are to be filled with a red ball and the other holes can be filled with any colour ball. In how many different ways can all the holes be filled from a box of 5 red balls and 10 mixed colour balls?

- (A) 345  
 (B) 425  
 (C) 445  
 (D) 465  
 (E) 485

23. In a newly launched video game 'Shoot At Sight', each player is supposed to shoot at targets on the screen. For each hit, the score of the player gets doubled while for each miss, his score gets halved. Each player is given 10 shots at the targets. Each player starts with 100 points in his account initially. The game is over as soon as a player uses all his 10 shots. Two friends, Jai and Viru, played the game and finished with a total of 6,400 and 1,600 points respectively.

Which of the following could be Viru's total points after his 8<sup>th</sup> shot?

- (A) 200  
 (B) 800



- (C) 1,000  
(D) 1,600  
(E) 3,200

**Directions for Questions 24–27:** Go through the given information and, based on it, solve the following questions:

A construction project involves certain activities to be done for its completion. Details of these activities are given below.

Certain conditions are necessary as given below:

Activity	Cost (Lakh Rupees)	Time Required (weeks)
X	7.5	6
Y	5	8
Z	10	4
A	12	10
B	9	5

- Activity Z can only be done when activities X and Y are completed.
- No two activities can be done simultaneously.
- If any activity is delayed, it involves a penalty of 20%.

**24.** If suddenly it was realised that one more activity C is required for completing the project costing Rs 9 lakh, then what is the approximate percentage increase in the cost of the project?

- (A) 19.5%  
(B) 19.8%  
(C) 20.6%  
(D) 21.0%  
(E) 21.1%

**25.** Activity B was delayed by 2 weeks, activity Y by 1 week, while all other activities were completed as planned. If activity Z cost 25% more than prescribed, then what was the cost of the project and time taken to complete the project?

- (A) Rs 48.3 lakh and 35 weeks  
(B) Rs 48.8 lakh and 35 weeks  
(C) Rs 48.3 lakh and 36 weeks  
(D) Rs 48.8 lakh and 36 weeks  
(E) Rs 48.5 lakh and 37 weeks

**26.** If after performing activity Z, it was realised that activity B was to be performed before activity Z and now it is required to deconstruct Z, which would require 1 week and involve Rs 2 lakh, then what is the percentage change in the cost of the project?

- (A) 30%  
(B) 31.8%  
(C) 32.18%  
(D) 33%  
(E) 33.2%

**27.** Activity Y takes 25% more time than prescribed for its completion and activity A has to be completed at the earliest opportunity. The project was started on February 1, 2012. If activity A has to be completed before activity Z because of certain constraints, when is the earliest possible day that activity Z can be started?

- (A) July 29, 2012  
(B) July 30, 2012  
(C) August 1, 2012  
(D) August 2, 2012  
(E) August 3, 2012

**Directions for Questions 28–30:** The following table gives the percentage breakdown of the total marks obtained by 5 students A, B, C, D and E in 6 subjects, P, Q, R, S, T and U, of their final exams. The maximum marks in each subject are 100 and every student got an integral score.

	P	Q	R	S	T	U
A	10	14	22	14	18	22
B	12	17	20	19	15	17
C	15	10	20	15	20	20
D	15	17	19	25	14	10
E	16	18	16	18	18	14

**28.** If out of these 5 students, E scored the highest marks in subject S, then his total score in all six subjects is definitely more than how many students?

- (A) 0  
(B) 1  
(C) 2  
(D) 3  
(E) 4

**29.** What can be the maximum possible total score for C?

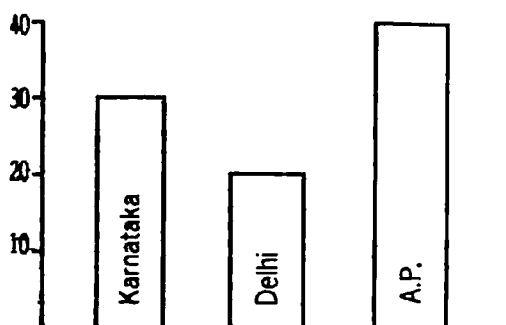
- (A) 400  
(B) 450

- (C) 500  
(D) 550  
(E) 600

30. If the pass marks in each subject are 20 and each student passed in all subjects, then what can be the minimum total score obtained by any of the 5 students?

- (A) 120  
(B) 150  
(C) 175  
(D) 200  
(E) 250

Directions for Questions 31–34: Use the following charts, which show the data of professionals in different functional areas of medicine in Karnataka, Delhi and A.P., to answer the questions.



Number of doctors in three states (in '000)

Area	Karnataka (%)	Delhi (%)	A.P. (%)
Dentist	50	37½	25
Physician	25	37½	25
Surgeon	12½	12½	18½
Specialists	12½	12½	31½

31. What is the number of physicians in A.P.?

- (A) 8,000  
(B) 8,900  
(C) 9,200  
(D) 10,000  
(E) 12,000

32. What is the ratio of the number of dentists in Karnataka to that in Delhi?

- (A) 1:2  
(B) 1:3

- (C) 2:1  
(D) 3:1  
(E) 3:5

33. If the number of dentists in A.P. increases by 10% and that in Delhi remains the same, then what is the ratio of the number of dentists in A.P. to that in Delhi?

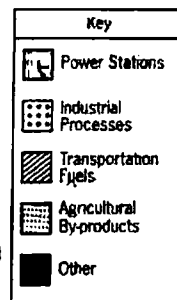
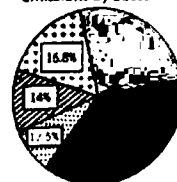
- (A) 11:30  
(B) 22:13  
(C) 22:15  
(D) 30:11  
(E) 35:11

34. What is the percentage difference between the number of specialists in Karnataka and that in Delhi?

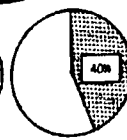
- (A) 0%  
(B) 50%  
(C) 100%  
(D) 150%  
(E) 180%

Directions for Questions 35–38: The total annual greenhouse gas emission in a country was 1,689 million tonnes in a certain year. Go through the given graphs and answer the questions based on them.

Annual Greenhouse Gas Emissions by Sector



Carbon Dioxide (72% of total)



Methane (18% of total)

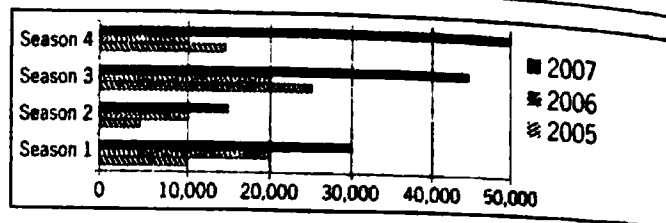
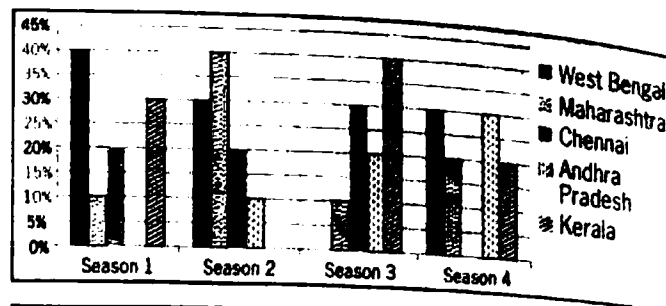
35. A scientist has reported that 18.1% of the methane gas emitted annually is caused by waste disposal. If 9.7% of the greenhouse gases emitted annually by other sectors are caused by waste disposal, approximately how many million tonnes of greenhouse gases, other than methane, are emitted annually due to waste disposal?

- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5

36. What was the total amount of methane gas emitted in the country that year from sources other than agricultural by-products?
- (A) 121.61 million tonnes  
(B) 134.71 million tonnes  
(C) 156.82 million tonnes  
(D) 182.41 million tonnes  
(E) 193.42 million tonnes
37. Greenhouse gases consist of carbon dioxide, methane, nitrous oxide and other gases and 1.5% of the nitrous oxide is emitted from transportation fuels. If 1% of greenhouse gases are other gases, what is the difference between the total annual greenhouse gas emission from transportation fuels and the total nitrous oxide emission from transportation fuels?
- (A) 148.32 million tonnes  
(B) 152.01 million tonnes  
(C) 228.63 million tonnes  
(D) 234.20 million tonnes  
(E) 236.46 million tonnes
38. What percentage of the annual greenhouse gas emitted from industrial processes comprises of carbon dioxide gas emitted from industrial processes?
- (A) 75.3%  
(B) 78.8%  
(C) 80.6%  
(D) 85.8%  
(E) 88.3%

**Directions for Questions 39–42:** Go through the given graphs and, based on them, solve the following questions:

The given bar graphs represent the runs scored by the Karnataka Ranji team in domestic cricket. Bar chart 1 gives the details of the runs scored by Karnataka against each of the 5 states as a percentage of the total runs scored by Karnataka. Chart 2 gives the details of the runs scored in each of the four seasons of three different years.

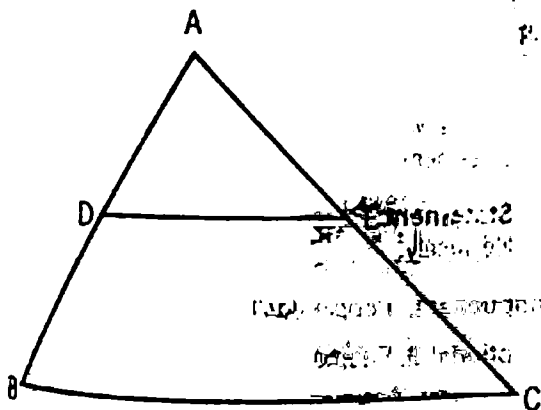


39. Assume that the percentage breakup of the runs scored against each state in each season was the same for all three years.
- Against which state did the Karnataka team score the maximum runs in the year 2005?
- (A) Kerala  
(B) Chennai  
(C) Maharashtra  
(D) West Bengal  
(E) Andhra Pradesh
40. What was the percentage change in the runs scored against Chennai from 2005 to 2006?
- (A) 14.3%  
(B) 17.2%  
(C) 18.2%  
(D) 20.2%  
(E) 33.2%
41. In which year and season did the runs scored against Maharashtra show the maximum change over the previous season in the year?
- (A) Season 3, year 2005  
(B) Season 4, year 2005  
(C) Season 2, year 2006  
(D) Season 2, year 2007  
(E) Season 4, year 2007
42. Which of the following is the maximum difference between the runs scored against any two states in any season?
- (A) 12,000  
(B) 13,000  
(C) 14,500  
(D) 15,500  
(E) 18,000

Directions for Questions 43–48: A question is followed by two statements, labelled (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

Select from the following options:

- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.  
 (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.  
 (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
 (D) EACH statement ALONE is sufficient.  
 (E) Statements (1) and (2) TOGETHER are not sufficient.
43. The sum of the ages of three persons A, B and C is 167 years. What is the age of B?  
 (1) B is  $\frac{17}{12}$  times as old as A.  
 (2) C is 44 years older than A.
44. The following picture shows a triangle ABC. A line is drawn so that it divides the other two sides at two distinct points D and E.



In triangle ABC, find the length of DE.

- (1) The length of side BC is 6 cm and DE is parallel to BC.  
 (2) Triangle ABC is a scalene triangle.
45. A mobile phone operator charges his customers on a monthly basis an amount given by  $y = a + bx$ , where 'y' is the bill amount, 'a' is the fixed charge per month, 'b' is the variable charge per call and 'x' is the number of calls made. These rates came into force from January and were in force till 30<sup>th</sup> June.
- From July, the variable charge is reduced by 50 paise per call and the fixed charge is increased by Rs 100

per month. What is the fixed charge charged by the company from 1<sup>st</sup> July, per month?

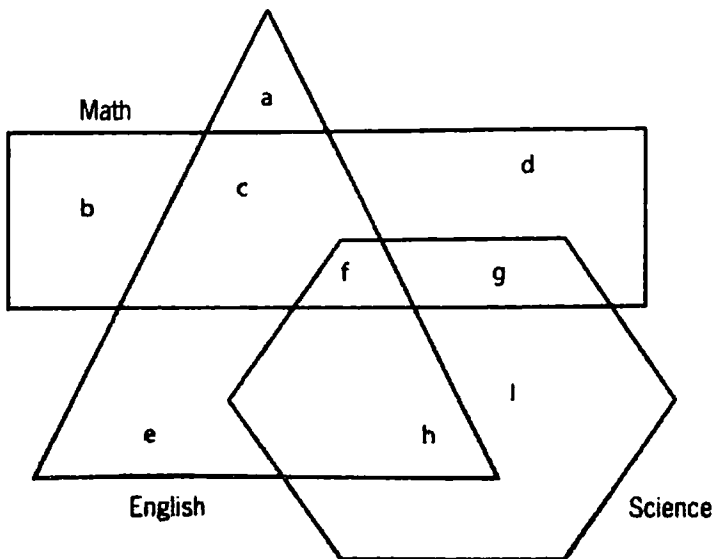
- (1) Mr. Anand who made 90 calls in January and 10 calls in February paid Rs 160 less in February than in January.  
 (2) The amount paid by Mr. Anand for January and February together was 250% of the amount paid by him in February.
46. Anshuman bought two articles from a sale and sold them to his friend Ankit. Did Anshuman make a profit or a loss?  
 (1) Anshuman sold both the articles at the same price.  
 (2) Of the two articles sold, Anshuman made a profit of  $p\%$  on one and incurred a loss of  $p\%$  on the other.
47. Are the integers A and B co-primes?  
 (1) The numbers A and B are the squares of two successive even numbers.  
 (2) Both A and B are distinct primes.
48. Is the product of the roots of the equation  $x^2 + bx + c = 0$  a rational number?

Statements:

- (1) Sum of the roots = 3.  
 (2) One of the roots is an irrational number.

# Reasoning Skills

- Directions:** Read the following information and answer the question.  
P, Q, R, S and T sit around a table.  
P sits two seats to the left of R and Q sits two seats to the right of R.  
If a new person U joins the group such that the initial conditions for the seating arrangement should be observed and also a new condition that U does not sit next to P, S or T be satisfied, then who will be the neighbours of P (one on either side)?  
(A) S and T  
(B) S and Q  
(C) T and R  
(D) R and Q  
(E) T and Q
- If Jeena is placed 19<sup>th</sup> from the top and Sheena is placed 54<sup>th</sup> from the bottom and Beena is standing 8 places below Jeena and Reena is standing 10 places above Sheena, then how many people are standing between Beena and Reena if the total number of people in the column is 100?  
(A) 7  
(B) 9  
(C) 11  
(D) 15  
(E) 18
- Directions:** The given diagram represents the students who are studying Maths, English and Science.



The students who are studying English and Maths but not Science are represented by:

- a
  - b
  - c
  - d
  - g
- Directions:** In the given question, there are five choices (A–E). Four of them are alike and one is different. Mark the one that is different.  
(A) adolescent  
(B) delinquent  
(C) jejune  
(D) juvenile  
(E) puerile
  - Directions:** A statement is given followed by two assumptions numbered I and II. An assumption is something supposed or taken for granted. Consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement  
  
**Statement:** People need to find better ways to live life wisely.  
  
**Assumptions: I.** People don't live life wisely.  
**Assumptions: II.** People have ways to live life wisely.  
(A) Only Assumption I is implicit.  
(B) Only Assumption II is implicit.  
(C) Both assumptions I and II are implicit.  
(D) Either assumption I or II is implicit.  
(E) Neither assumption I nor II is implicit.
  - Directions:** A statement or more is followed by three courses of action numbered I, II and III. A course of action is a step or administrative decision to be taken for improvement, follow up or further action in regard to the problem, policy, etc. On the basis of the information given in the statement, assuming everything in the statement to be true, decide which of the suggested courses of action should logically be pursued.

**Statement:** One of the oldest aviation training facilities in the country, the Bombay Flying Club (BFC), is heading for closure. The flight operations of the club, started in the early 1920s, have been closed for the past 18 months. During this period not a single flight has taken off, since the club does not have a Chief Flying Instructor (CFI). Enrolled at a whopping fee of Rs 8 lakh for the Commercial Pilot Licence (CPL), some of the students have already shifted to other institutes to complete their course.

**Courses of Action:**

- I. Students should be discouraged from leaving the institute.
  - II. Criminal proceedings for cheating (the students) should be initiated against the Flying Club.
  - III. The Flying Club should procure more Cessna aircrafts to train the students.
- (A) Only I should be pursued.  
 (B) Only II should be pursued.  
 (C) Both I and II should be pursued.  
 (D) All should be pursued.  
 (E) None should be pursued.
7. **Directions:** Given alongside are a few facts. Based on these facts, select from among the given statements, the statement that can be concluded to be a fact.

**Facts:**

1. Prof Gupta from the Delhi College of Arts and Sciences wrote two books, one in the area of sociology of science and the other in the area of work sociology.
2. Sociology of Sciences is published by a foreign publisher.
3. Books published by Indian publishers are less expensive.

**Statements:**

- I. Sociology of Science is more expensive.
  - II. Sociology of Work is published by an Indian publisher.
  - III. Sociology of Work is priced high.
- (A) Statement II can be concluded.  
 (B) Statement III can be concluded.  
 (C) Statements I and II can be concluded.  
 (D) Statements I and III can be concluded.  
 (E) None of the statements can be concluded.

8. **Directions:** Given below is a statement followed by three arguments numbered I, II, and III. Decide which of the given arguments is strong and is able to support the given statement.

**Statement:** Smoking is injurious to health.

**Argument:**

- I. Many smokers are known to have died of heart and lung diseases.
  - II. More smokers die of cancer than non-smokers.
  - III. Smoking causes lung cancer.
- (A) Only Argument I is strong.  
 (B) Only Argument II is strong.  
 (C) Only Argument III is strong.  
 (D) Only Arguments II and III are strong.  
 (E) All of the arguments are strong.
9. In a certain code language the word EMOTICON is coded as FNPJJDPO, how is DUBIOUS coded in the same language?  
 (A) EVCJPVT  
 (B) EVCKPVT  
 (C) FWLDQWU  
 (D) VEKCPVT  
 (E) WLDQFUD
10. In a certain code language, RELINQUISH is coded as UHOLQPTHG. How will OPTIMISTIC be coded in this language?  
 (A) PQVOKRSBVO  
 (B) QRSFLOPNDB  
 (C) RSPOERHSPO  
 (D) RSWLPHRSHB  
 (E) RSWLPISID
11. If 'x' means '-', '+' means 'x', '-' means '÷' and '÷' means '+', find the value of  $\frac{12 \times 4 \div 2 + 8 - 2}{4 + 3 - 1 \times 2 \div 2}$

- (A)  $\frac{2}{3}$   
 (B)  $\frac{4}{3}$   
 (C)  $\frac{5}{3}$   
 (D)  $\frac{7}{3}$   
 (E)  $\frac{8}{3}$

12. In a certain language, HUNIKA is coded as 93223 and TARITA is coded as 212127. What will be the code of NIVEDITA in this language?

(A) 1529318  
(B) 2915429  
(C) 1429319  
(D) 1415429  
(E) 1529319

**Directions for Questions 13–16:** Refer to the data below and answer the questions that follow.

- I. A wooden pyramid is kept on a table.
- II. Pictures of a zebra, a lion, an elephant, a fox and a deer are drawn, one each on all the four faces and its base.
- III. Each picture is painted in a different colour—blue, grey, black, yellow and brown.
- IV. The lion which is in a brown colour, is not on the opposite face of the black coloured picture.
- V. The deer is on the adjacent face of the blue coloured elephant.
- VI. The colour of the picture of the zebra is not grey and it is opposite to the yellow coloured animal.
- VII. The grey coloured picture is not on any of the faces.

13. Which of the following statements is not true?

(A) The deer is blue.  
(B) The zebra is black.  
(C) The fox is not seen from any of the faces.  
(D) Yellow and grey colours are not opposite to each other.  
(E) None of these

14. Which of these is the colour combination of the pictures on opposite faces?

(A) brown - black  
(B) grey - black  
(C) yellow - black  
(D) yellow - brown  
(E) cannot be determined

15. Which of the following animals are on the two adjacent faces of the lion?

(A) deer - elephant  
(B) zebra - deer  
(C) zebra - elephant  
(D) zebra - fox  
(E) cannot be determined

16. If the location of the animal in grey is interchanged with that of the one in brown and the location of the animal in yellow is interchanged with that of the one in black, which combination of animals will be on the faces adjacent to the deer?

(A) elephant - zebra  
(B) fox - elephant  
(C) fox - zebra  
(D) lion - elephant  
(E) zebra - lion

**Directions for Questions 17–20:** Based on the information given below, answer the question given alongside.

The CM called 6 of his senior MLAs and asked them to apply for a position in one of the three departments—Home, Finance and Education. Every department was to have one Minister and one Deputy Minister. Every MLA was asked to write their choice of department and position. No two MLAs gave the same choice. After writing the choice, each MLA spoke one truth and one lie.

- A – Truth – Did not apply for Finance, Lie – Applied for Deputy Minister's position in Home  
B – Truth – Applied for Minister's position only, Lie – Applied for Home  
C – Truth – Applied for Education, Lie – Applied for Minister's position only  
D – Truth – Applied for Deputy Minister's position, Lie – Applied for Minister's position in Finance  
E – Truth – Did not apply for Home, Lie – Applied for Minister's position only  
F – Truth – Applied for Finance, Lie – Applied for Deputy Minister's position

17. Who has applied for the Deputy Minister's position in the Education department?

(A) A  
(B) B  
(C) C  
(D) D  
(E) E

18. Which position will D hold?

(A) Minister – Home  
(B) Minister – Education  
(C) Deputy Minister – Home  
(D) Deputy Minister – Finance  
(E) Deputy Minister – Education

19. Who will be the Minister of Finance?

- (A) B
- (B) C
- (C) D
- (D) E
- (E) F

20. Which position did A apply for?

- (A) Minister – Home
- (B) Minister – Education
- (C) Deputy Minister – Home
- (D) Deputy Minister – Finance
- (E) Deputy Minister – Education

Directions for Question 21–24: A word-arrangement machine rearranges its input using a particular rule. The following is the illustration of the input and the steps of rearrangements. Use the same logic to answer the question that follows.

Input	a	boon	to	the	learning	mind
Step 1:	learning	a	boon	to	the	mind
Step 2:	learning	mind	a	boon	to	the
Step 3:	learning	mind	boon	a	to	the
Step 4:	learning	mind	boon	the	a	to
Step 5:	learning	mind	boon	the	to	a

21. Which of the following would be the third step for the following input?

Input: The world cup final was held at Brazil's capital

- (A) capital Brazil's the world cup final was held at
- (B) capital Brazil's world final held the cup was at
- (C) capital Brazil's world final the cup was held at
- (D) capital Brazil's world the cup final was held at
- (E) capital the world cup final was held at Brazil's

22. How many steps will be required to get the final output from the following input?

Input: Kolkata is called the city of palaces

- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 6

23. If the following is the second step of an input, what will be the third word from the left in Step 4?

Step 2: school late you are for the

- (A) are
- (B) for
- (C) the
- (D) you
- (E) late

24. If the following is the second step of an input, what will be the fourth step?

Step 2: monsoon gathers arrives rain as pace in July

- (A) monsoon gathers arrives rain pace July as in
- (B) monsoon gathers arrives rain pace as in July
- (C) monsoon gathers arrives rain pace July in as
- (D) monsoon gathers arrives as rain pace in July
- (E) monsoon gathers rain pace as in July arrives

25. Read the information below and answer the question that follows.

Saroj, Raman and Shivam are Mrs and Mr Sharma's children.

Reeta, Rajan and Sumit are Mrs and Mr Pandey's children.

Sumit is married to Saroj.

Mr Sharma has two sons and one daughter who is Saroj.

Aman and Sanjay are Sumit's sons.

Gauri and Reshabh are Mrs and Mr Kapoor's children.

Gauri is married to Shivam and has three children, Riya, Sanju and Rajiv.

Priyanka is Riya's friend, and Mrs and Mr Lamba's daughter.

What is Aman's surname?

- (A) Lamba
- (B) Kapoor
- (C) Pandey
- (D) Sharma
- (E) Cannot be determined



26. If X is the father of Y and Z, while Z is also B's brother and A is Y's mother, then, which of the following cannot necessarily be true?
- (A) A is the mother of B.  
 (B) B is the brother of Z.  
 (C) X is the father of B.  
 (D) Z is the brother of Y.  
 (E) Z is the son of A.
27. We are bombarded with misguided advertisements that give advice on healthy-eating, and this has had the effect of making food seem hugely complicated. People are demoralised because they are trying to follow this advice, yet they are getting fatter and fatter. For lots of people, food has become a minefield of do's and don'ts and a relaxed appreciation of the pleasures of eating has got a bit lost along the way. In fact, eating well is simple when you apply a few fundamental principles.

What can be concluded from the above?

- (A) Advertisements have continuously misguided the general public about healthy eating.  
 (B) In our pursuit of healthy eating, we have forgotten the small pleasures of eating.  
 (C) The do's and don'ts of healthy eating have become an integral part of our lives.  
 (D) Eating becomes healthy only if we apply some basic rules to it.  
 (E) Healthy eating has been simplified by the government.
28. Ramesh whose results were yet to be announced, was seeking information about the college's admission procedure. The college is known to admit only those students who score above 95% in PCM.

What can be inferred from the above statements?

- (A) Ramesh had scored above 95% in PCM.  
 (B) Ramesh was confident of scoring above 95% in PCM.  
 (C) Like all kids, Ramesh was coming under parental pressure to apply to all colleges.  
 (D) The college had announced a possible increase in the cut-off score for admissions into their science stream that year.  
 (E) The college had announced a possible reduction in the cut-off score for admissions into their science stream that year.
29. A group of researchers in Boston, Massachusetts have developed a dietary supplement that triggers

the body to increase the levels of free testosterone naturally and safely.

Which of the following can be most inferred from the statement above?

- (A) Testosterone in the body can only be increased through dietary supplements.  
 (B) Testosterone in the body could not be increased before this epochal research result.  
 (C) Testosterone when provided as a dietary supplement, does not attach itself with anything and is found to be free.  
 (D) Increasing testosterone in the body used to be possible before this research attempt too, however, they were perhaps unsafe and artificially induced.  
 (E) There are two types of testosterone in the body—bonded that attach to molecules and are mostly ineffective and free testosterone that can easily enter cells and increases strength and stamina.

30. The study showed that criminals from the lower socio-economic strata also had limited access to schooling.

The argument above seems to be:

- (A) an inference  
 (B) a conclusion  
 (C) an assumption  
 (D) an argument-weakening statement  
 (E) an argument-strengthening statement

31. Ram always spoke about the new joinee as a serious and non-partying type of a person.

Which of the following statements will weaken the above argument?

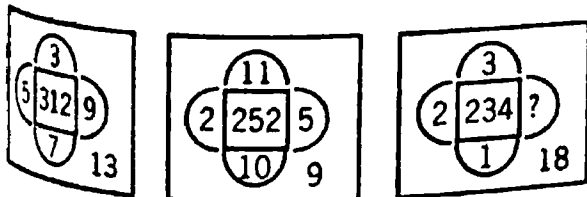
- (A) At the annual meeting of the company, the new joinee was seen sitting quietly in one corner.  
 (B) At the annual meeting of the company, the new joinee was seen making polite conversations with people.  
 (C) At the annual meeting of the company, the new joinee sat and watched everyone dancing and merry making.  
 (D) At the annual meeting of the company, the new joinee was seen losing his cool and walking off from the scene of the party in a huff.  
 (E) At the annual meeting of the company, the new joinee had let his hair down and seemed to be getting along with people like a house on fire.

32. Anita: I sold my house through a real estate agent last year and was happy with the price that I received. My house was sold quickly and I did not have to suffer any advertising hassles. I would advise against selling your house through Internet websites, newspapers or magazine listings.

Babbu: It is in the interest of the Internet websites, newspapers and magazines to get me the best price for my property because they are a relatively new medium wanting to establish themselves. Besides, their fee is dependent on the selling price. Therefore, while selling my house I will certainly use Internet websites, newspapers or magazine listings rather than trying to sell the house through a real estate agent.

All of the following statements are strengthening Babbu's argument. Which one is the EXCEPTION?

- (A) Both mediums are different so it is unfair to compare them.  
 (B) Houses often obtain a lower price when sold through a real estate agent.  
 (C) Some customers pay these Internet websites, newspapers and magazines to find them a less-expensive house.  
 (D) The Internet website, newspaper and magazine services include many add-on benefits in terms of legal advice, market report and advice that a real estate agent usually hides.  
 (E) The fee that the Internet websites, newspapers and magazines charge is usually less than the difference between the amount that a real estate agent would charge and the amount that the Internet websites, newspapers and magazines would charge.
33. In the figure below, which number can substitute the question mark?



- (A) 9  
 (B) 7  
 (C) 5  
 (D) 3  
 (E) 0

34. What should be in place of the question mark in the figure?

3	2	5	10
4	11	7	?
73	129	368	1144

- (A) 3  
 (B) 4  
 (C) 6  
 (D) 8  
 (E) 12
35. What is next in the series?

1, 2, 9, 64, 625, ?

- (A) 746  
 (B) 960  
 (C) 2960  
 (D) 5966  
 (E) 7776

36. Out of a total of 150 students in a school, 43 students passed only Pre Medical Test (PMT), 29 passed only Pre Engineering Test (PET), and 62 passed only Pre Pharmacy Test (PPT). Six students passed all the three tests. 4 students did not pass the PMT but passed the other two tests. PPT was passed by 50% of the students. A total of 55 students passed PMT. How many students passed both PMT and PET?

- (A) 3  
 (B) 4  
 (C) 5  
 (D) 6  
 (E) 10

37. Of 1560 girls, 230 did not play tennis or badminton, 50 did not play hockey or tennis and 40 girls did not play badminton or hockey. 525 played both tennis and badminton, 545 played both hockey and tennis and 510 played both hockey and badminton. How many girls played all three sports?

- (A) 45  
 (B) 170  
 (C) 300  
 (D) 400  
 (E) 1005

38. Many small-scale sector units in India become unviable and close down resulting in a huge loss to both the entrepreneur and the government.

What decision should the government take in this situation?

- (A) The banks should be asked to provide cheaper loans to the small-scale sector units.
  - (B) The government should appoint a technical committee to find out the reasons for the units' closure.
  - (C) The entrepreneurs should be encouraged to restart their ventures as one should not give up after a failure.
  - (D) The government should give contracts only to multinationals to develop the small-scale sector units in India.
  - (E) The government should discourage the small-scale sector units in India as it eventually results in losses and failed entrepreneurship.
39. Which of the following could be correct if for a certain equation,  $AAAC + B4 = AAC0$ ?

- (A)  $A = \frac{B}{2}$
- (B)  $A = \frac{C}{2}$
- (C)  $B = \frac{A}{2}$
- (D)  $C = \frac{B}{2}$
- (E)  $C = \frac{A}{2}$

40. Find  $A + B$  if  $\left(\frac{AAA + B}{A}\right) \times 9 = 10AB$

- (A) 4
- (B) 6
- (C) 7
- (D) 8
- (E) 9

# Answer Key

## Language Skills

**Passage for Questions 1–4** One of the most frightening and destructive phenomena of nature is a severe earthquake and its terrible after effects. Such earthquakes can trigger landslides, avalanches, fires, floods, volcanic eruptions and tsunamis. An earthquake, also known as a quake, tremor or temblor, is the result of an abrupt release of accumulated energy in the Earth's crust that creates seismic waves.

Sometimes the sliding plates in the Earth's outer layer get locked and are unable to release the accumulated energy. When this energy grows strong enough, the plates break free and release it in the Earth's crust. In the process, vibrations called "seismic waves" are generated. These vibrations cause portions of the earth to shake.

The British engineer John Michell was one of the first to give a scientific cause for earthquakes. In his memoirs in 1760 AD, Michell wrote that earthquakes and the waves of energy that they make are caused by "shifting masses of rock miles below the surface". An earthquake's point of initial rupture is called its hypocentre. The epicentre is the point at ground level directly above the hypocentre.

Earthquakes beneath the ocean floor sometimes generate immense sea waves or tsunamis. These waves travel across oceans at high speeds and may be up to 15 metres high or higher when they reach the shore. Earthquakes are caused mostly by rupture of geological faults, but also by other events such as volcanic activity, landslides and human activities like coal mining, oil drilling and nuclear blasts.

It is estimated that there are 500,000 detectable earthquakes in the world each year, about 100 of them that end up causing damage. The magnitude of an earthquake, usually expressed by the Richter scale, is a measure of the amplitude of the seismic waves. The magnitude of an earthquake is a measure of the amount of energy released. It is also the most common scale on which earthquakes larger than around 5 are reported worldwide.

In addition to the magnitude and local geologic conditions, the factors which determine an earthquake's destructiveness include the focal depth, the distance from the epicentre, the design and construction of buildings and the density of population in the area. The devastating earthquake that struck Japan in March 2011 had a magnitude of 9.0. The largest earthquake that has been measured on a seismograph reached 9.5 magnitude, and had occurred in 1960. Its epicentre was near Cañete, Chile.

Due to the rapid growth of mega-cities such as Mexico City, Tokyo and Tehran, in areas of high seismic risk, some seismologists warn that a single quake may claim the lives of up to 3 million

people. Most natural hazards can be detected before they strike. However, science till now has failed to predict earthquakes. They come without warning and continue to kill. Luckily, earthquakes have some patterns. Sometimes foreshocks precede quakes, though they seem like minor quakes.

Seismologists are making and testing theories of earthquake prediction. Experimental forecasts are beginning to show success at pointing out impending seismicity. These scientific triumphs, however, are many years away from practical application.

### Passage 1

**Topic:** Earthquakes

**Scope:** A description of earthquakes—their types, causes and impact. The ongoing efforts made to predict earthquakes effectively

### Passage Map

**P1, P2 and P3:** Definition of earthquake; how an earthquake occurs

**P4:** Causes of earthquakes

**P5:** Measuring earthquakes

**P6, P7:** Predicting earthquakes—the progress made and the challenges remaining

1. Which of the following is the best title for the passage?

- (A) Predicting earthquakes
- (B) The causes of earthquakes
- (C) Understanding natural disasters
- (D) The devastating effects of earthquakes
- (E) General information about earthquakes

The passage provides an overview of the various aspects of earthquakes—their causes, impact, measurement techniques, etc. This makes option E the correct choice as it encompasses the different elements that have been discussed. The other options are limited in their scope and apply to certain paragraphs of the passage only.

The correct answer is E.

2. Which of the following is not mentioned in the passage as the cause of earthquakes?

- (A) Oil mining
- (B) Coal mining

- (C) Geological faults
- (D) The abrupt release of the accumulated energy
- (E) The speed of the sliding plates in the Earth's outer layer

Refer to the lines *".....Earthquakes are caused mostly by rupture of geological faults, but also by other events such as volcanic activity, landslides and human activities like coal mining, oil drilling and nuclear blasts...."* This makes option E incorrect.

**The correct answer is E.**

3. Which of the following statements is supported by the passage?

- (A) Adequate measures have been taken in cities like Mexico City, Tokyo and Tehran to protect the structures against potential hazards of earthquakes.
- (B) The distance from the epicentre is one of the important factors that can determine the destructiveness of the earthquake.
- (C) Seismologists' efforts to find ways to predict earthquakes will never succeed.
- (D) The Richter Scale cannot measure the earthquake of magnitude higher than 5.
- (E) Every year, the world witnesses 500,000 destructive earthquakes.

Options A, C, D and E contradict the information provided in the passage. Option B can be ascertained from the lines *".....the factors which determine an earthquake's destructiveness include the focal depth, the distance from the epicentre...."*

**The correct answer is B.**

4. The author discusses the topic of predicting earthquakes in order to suggest that:

- (A) predicting earthquakes is difficult and the efforts towards developing a perfect system may never succeed.
- (B) inadequate efforts are made to develop the warning system about the impending earthquakes.
- (C) seismologists have achieved modest success in analysing the causes of the earthquakes.
- (D) making a forecast about earthquakes is difficult but efforts are being made.
- (E) until now, scientists have failed to predict natural disasters.

Refer to the lines *".....Seismologists are making and testing theories of earthquake prediction.*

*Experimental forecasts are beginning to show success at pointing out impending seismicity...."* It can be deduced from these lines that efforts are being made to develop scientific systems to predict earthquakes. This makes option D correct. Options A and B are extreme in their suggestions, while Option C is not mentioned in the passage. Option E is outside the scope as it talks about all "natural disasters".

**The correct answer is D.**

**Passage for Questions 5–8** There was virtually no daily press when the First Amendment was written during Washington's presidency. The daily newspaper is largely the product of the mid-19<sup>th</sup> century; radio and television have been around since the first half of the 20<sup>th</sup> century. As recently as the presidency of Herbert Hoover (1929–1933), reporters submitted their questions to the President in writing and he responded in writing, if at all. As Hoover put it, 'The President of the United States will not stand and be questioned like a chicken thief by men whose names he does not even know.'

Hoover's successor, Franklin D. Roosevelt (1933–1945), practically invented media politics. To Roosevelt, the media was a potential ally. Roosevelt promised reporters two press conferences—presidential meetings with reporters—a week, resulting in about 1,000 press conferences in his 12 years in the White House. FDR was the first president to use the radio, broadcasting a series of reassuring 'fireside chats' to the Depression-ridden nation. Roosevelt's crafty use of radio helped him win four presidential elections. Theodore White tells the story of the time in 1944 when FDR found out that his opponent, Thomas E. Dewey, had purchased 15 minutes of air time on NBC immediately following his own address. Roosevelt spoke for 14 minutes and then left 1 minute silent. Thinking that the network had experienced technical difficulties, many listeners changed their dials before Dewey came on the air.

Another of Roosevelt's talents was knowing how to feed the right story to the right reporter. He used presidential wrath to warn reporters off material he did not want covered and he chastised news reports he deemed inaccurate. His wrath was rarely invoked, however, and the press revered him, never even reporting to the American public that the President was confined to a wheelchair. The idea that a political leader's private life might be public business was alien to journalists in FDR's day. The relatively cosy relationship between politicians and the press lasted through the early 1960s. ABC's Sam Donaldson has said that when he first came to Washington in 1961, 'many reporters saw themselves as an extension of the government, accepting, with very little skepticism, what government officials told them.'

## Passage 2

Topic: Media and Politics

Scope: The evolving nature of interactions between media and politics; the impact of the different Presidents on these changing dynamics.

## Passage Map

P1: Historical background of the role played by the media in its initial phases with respect to the political landscape

P2: Franklin D. Roosevelt's utilization of media to promote political views and perspectives

P3: The cordial relations between media and government; media respected the privacy of politicians

5. What is the central idea of the passage?

- (A) Defining the role of media in the political scenario
- (B) Defining the role of the president during the Depression
- (C) Understanding the stages of development of media politics
- (D) Recognizing the importance of healthy skepticism on the part of the media
- (E) Exploring how politicians controlled the media since the country's beginning

The passage explores the growth and development of media politics and its changing dynamics. It traces the progress made in this area and the role played by different political luminaries. This makes all options except option C incorrect.

The correct answer is C.

6. Which of the following facts suggests the idea that a political leader's private life might be public business was alien to journalists in FDR's day?

- (A) President Roosevelt's dependency on a wheelchair did not become public knowledge.
- (B) Media persons during President Roosevelt's time considered themselves an extension of the government.
- (C) A stable and healthy relationship between the media and politicians existed during President Roosevelt's term.
- (D) President Roosevelt used his presidential wrath to chastise the material and news reports he deemed inaccurate.
- (E) Though he addressed 1,000 press conferences in his 12 years in the White House, President Roosevelt never disclosed his personal life in them.

Refer to the lines ".....and the press revered him, never even reporting to the American public that the President was confined to a wheelchair....." This makes option A correct. Option E is not mentioned in the passage, while the other options, though factually correct, don't demonstrate the idea being discussed.

The correct answer is A.

7. According to the author, what can be concluded from the passage?

- (A) Politicians control the media.
- (B) The press has always been skeptical of political leaders.
- (C) The media's role in politics has evolved through the presidencies.
- (D) Effective use of the media is a pre-requisite for a successful political career in the US.
- (E) The public recognised the talents of President Roosevelt because of the honest treatment by the press.

Based on an analysis of the passage, the only conclusion that can be drawn is that the role played by the media in politics has changed over different presidencies. From the time of President Hoover, when questions were submitted in writing and responded to in the same fashion, to the Presidency of FDR, when the media was used to propagate a particular perspective, media politics has undergone a sea change. The other options are either fallacious or beyond the scope of the passage.

The correct answer is C.

8. The author agrees with all of the following statements EXCEPT:

- (A) President Franklin D. Roosevelt considered the media a potential ally.
- (B) Healthy relationships between politicians and the press never existed.
- (C) Reporters never publicised the personal life of a politician in the early days.
- (D) President Roosevelt's crafty use of radio helped him win four presidential elections.
- (E) President Roosevelt controlled the media reporters and never let them publish any content he considered inaccurate.

All the statements except statement B can easily be ascertained from the passage.

The correct answer is B.

9. Select the word that is nearly the opposite in meaning to the given word: *mellow*

(A) aged  
(B) ugly  
(C) harsh  
(D) delicate  
(E) developed

Mellow refers to a soft or smooth sound, colour or flavour; one that has no harshness or jarring notes to it. Hence, the correct antonym will be harsh.

**The correct answer is C.**

10. Select the word or phrase that is nearly the opposite in meaning to the given word: *precise*

(A) careless  
(B) inflexible  
(C) restricted  
(D) ambiguous  
(E) uncompromising

Precise is used to indicate exactness and accuracy in expression or detail. The correct antonym is ambiguous which indicates ambivalence or susceptibility to multiple interpretations.

**The correct answer is D.**

11. Select the word or phrase that is nearly the opposite in meaning to the given word: *pertinacity*

(A) impatience  
(B) irrelevance  
(C) pliancy  
(D) rigidity  
(E) stubbornness

Persistence, perseverance and tenacity are synonyms for the word pertinacity, which refers to the quality of determination and commitment to an ideal or a goal. Rigidity and stubbornness can act as synonyms for the same. The correct antonym is pliancy which refers to an adaptable, flexible attitude.

**The correct answer is C.**

12. Select the word or phrase that is nearest in meaning to the given word: *obstreperous*

(A) obstructive  
(B) noisy  
(C) energetic  
(D) disruptive  
(E) destructive

Obstreperous refers to someone who is noisy and difficult to control. It can be used to refer to groups or crowds that rebel or protest against something. Hence, the correct synonym is noisy.

**The correct answer is B.**

13. Select the word or phrase that is nearest in meaning to the given word: *gouge*

(A) injure  
(B) extort  
(C) punch  
(D) compel  
(E) extricate

Though the word 'gouge' is generally used to indicate an indentation or a groove, the word has another meaning as well—to swindle or overcharge. Thus, out of the options given, option B presents the correct synonym.

**The correct answer is B.**

**Directions for Questions 14–17:** The following passage has blanks that have been numbered (1) to (4). From the given words, fill in the blanks with the most appropriate words.

The situation may be summed (1) by saying that a variety of forces are bringing (2) the destruction of the caste-based system of production in the villages and at the local level. (3) individual castes increasingly competing with each other (4) access to secular benefits, the conflict is only likely to become sharper.

14. (1)

(A) up  
(B) in  
(C) at  
(D) about  
(E) around

The idiomatic expression 'summed up' is required here. To 'sum up' something is to provide a summary or a concise statement of the relevant information.

**The correct answer is A.**

15. (2)

(A) alongside  
(B) across  
(C) about  
(D) up  
(E) in

The phrasal verb 'bringing about' will be used here. To 'bring about' is to catalyze or trigger a change in a situation.

The correct answer is C.

(3)

16.

- (A) Besides
- (B) Along
- (C) Beyond
- (D) Behind
- (E) With

The preposition 'with' has multiple uses. It is used when we are considering one fact in relation to another. Therefore, the logical structure of the sentence is retained by using 'with'.

The correct answer is E.

(4)

17.

- (A) by
- (B) with
- (C) in
- (D) at
- (E) for

One competes for something. Hence, the preposition 'for' will be used here.

The correct answer is E.

Directions for Questions 18–21: Rearrange the jumbled sentences to show the appropriate sequence.

18. (A) He would have said, undoubtedly, that he had found a nation of poets.
- (B) There was hardly any such thing as slang in his day, for no graphic trope was too virile or uncommon for acceptance, if its meaning were patent.
- (C) If Shakespeare were to have come to Chicago and heard the man in the street, he'd have found himself more at home than in London.
- (D) In the mouths of clerks, he'd have found English being used with all the freedom of unexpected metaphor, and the plastic, suggestive diction that used to be the privilege of the Elizabethan dramatists.
- (E) His own heroes often spoke what corresponds to the slang of today.
- (A) CADEB
- (B) CDEBA

(C) CBDAE

(D) CEDBA

(E) CDABE

CD is a mandatory pair with C being the opening sentence. This is because it introduces the idea and contains the proper name of the writer whose works are being discussed. D elaborates the idea initiated in C. Forming this mandatory pair eliminates all options except B and E. It is clear that A has to follow D as it does not make logical sense anywhere else in the passage. This makes option E the correct answer.

The correct answer is E.

19. (A) For a while, his head spun when he saw the victim in a pool of blood.
- (B) As soon as the victim was sent to the operating theatre, the duty doctor inside screamed in shock to see his only son on the operating table.
- (C) A while later, he came to his senses, and called the ambulance.
- (D) Jack was in a maddening hurry to catch the train when he witnessed the gory incident.
- (E) What happened then was even more dramatic.
- (A) ABCDE
- (B) EADBC
- (C) BECDA
- (D) CABDE
- (E) DACEB

This question can be easily answered by identifying the chronological sequence. The opening sentence has to be D as it begins the description of the events. Then, AC should follow as they indicate the correct time sequence—'for a while' and 'a while later'. E continues the sequence with B closing the description.

The correct answer is E.

20. (A) Nineteen fossilised teeth of *Paranthropus robustus* and *Australopithecus africanus* from caves in South Africa, when subjected to Strontium isotope analysis by researchers of the Max Planck Institute for Evolutionary Anthropology in Leipzig, revealed that females spent their early growth years away from the caves where they were later found, strengthening the migration theory.



- (B) The origins of the patrilocality practice of women leaving their natal families/communities after marriage can thus be traced back to the time prior to the evolution of modern humans.
- (C) The females seem to have travelled at least some distance to join a different group and mate with a male partner.
- (D) A study of millions of years old enamel of fossilised teeth of hominids, the early ancestors of humans, reveals a pattern of female migration.
- (A) ADCB
- (B) DABC
- (C) ACDB
- (D) DACB
- (E) ABCD

DA form a mandatory pair as D introduces the general idea and A provides specific data supporting the idea. This is followed by CB—C further elucidates the findings and B is the concluding line of the passage.

**The correct answer is D.**

21. (A) There are some people who relate anger to upbringing or food intake.
- (B) German researchers too found out that a certain strain of the gene caused more havoc than others.
- (C) The strain was found to affect dopamine, a brain chemical that is linked to anger and aggression.
- (D) However, the discovery and isolation of a certain gene explains why certain people fly into a rage.
- (A) ACBD
- (B) BDAC
- (C) DBAC
- (D) ADBC
- (E) ABCD

AD forms a logical pair. This becomes evident once you identify the contrasting word 'however' in option D and link it with A. B further extends the idea brought forward in D and C forms the concluding sentence.

**The correct answer is D.**

**Directions for Questions 22–25:** In the given question, the sentence has four underlined words or phrases. Identify

the one underlined word or phrase that must be changed in order to make the sentence correct. Mark (E) for no error.

22. The constellation Aquarius was associated with the rainy seasons by a large amount of ancient civilisations.
- (A) associated
- (B) rainy
- (C) large
- (D) amount
- (E) No error

'Amount' is used for nouns that can't be counted—water, emotions, etc. In case of countable nouns—pen, pebbles, phones, etc., we use 'number'. The two cannot be used interchangeably. As we can count the number of ancient civilisations, the use of 'amount' is incorrect.

**The correct answer is D.**

23. It is a common observation that many a man have resigned to fate.
- (A) a common
- (B) many a man
- (C) have resigned
- (D) to fate
- (E) No error

The word 'many' takes the plural form, that is, it is used with plural count nouns and takes the plural verb—many books are..., many ideas were..., many things, etc. However, 'many a' is accompanied by singular count nouns and takes the singular verb—'many a traveler', 'many a writer'. Hence, the correct sentence will be: *It is a common observation that many a man has resigned to fate.*

**The correct answer is C.**

24. The third one-day match between India and New Zealand hadn't hardly begun when it started to rain.
- (A) between
- (B) hadn't
- (C) begun
- (D) to rain
- (E) No error

The use of hadn't and hardly in the same sentence leads to a double negative. Here the sentence should read—"The third one-day match between India and New Zealand had hardly begun before it started to rain."

The correct answer is B.

25. Although I have worked in this office for over two years, I am yet to find a person with who I feel comfortable.

- (A) Although
- (B) for
- (C) yet
- (D) who
- (E) No error

The object pronoun 'whom' is required here. The sentence should read—*Although I have worked in this office for over two years, I am yet to find a person with whom I feel comfortable.*

The correct answer is D.

Directions for Questions 26–29: Choose the set of prepositions whose meaning and sequence best fits the 3 given sentences.

26. (1) Clinton said that the new Afghan policy will be on hold \_\_\_\_\_ the new government in that country is in place.  
 (2) The results of the 20 August presidential elections are yet \_\_\_\_\_ be declared.  
 (3) \_\_\_\_\_ areas of bilateral cooperation, they also discussed issues related to counter-terrorism.
- (a) to
  - (b) till
  - (c) after
  - (d) since
  - (e) beyond
  - (f) besides
- (A) baf
  - (B) abd
  - (C) abf
  - (D) acf
  - (E) acb

The preposition 'till' is required for the first blank in order to indicate the time up to the event being discussed. The second blank requires 'to'. 'Besides' will be used in the third blank as it implies 'in addition to'.

The correct answer is A.

27. (1) The mysterious appearance \_\_\_\_\_ Rahul in Tihar led to much commotion in a cluster of 15-20 houses.  
 (2) A surprising finding has come about \_\_\_\_\_ the ingenuity, perseverance and international cooperation.  
 (3) \_\_\_\_\_ silicate bodies, such features are typically attributed to water and hydroxyl-bearing materials.
- (a) as
  - (b) of
  - (c) for
  - (d) from
  - (e) after
  - (f) through
- (A) abc
  - (B) bcd
  - (C) abf
  - (D) bfc
  - (E) bda

The first blank will take the preposition 'of'. The preposition 'through' takes several meanings, one of which is 'because of', that is, we use this preposition to indicate that something has been achieved because of someone or something or with the help of someone. The third blank will take 'for'.

The correct answer is D.

28. (1) At the sound of the bell, the instructor asked the students to hand \_\_\_\_\_ their test papers.  
 (2) I am really surprised that you turned \_\_\_\_\_ an offer which other people would have jumped at.  
 (3) I shall always remain indebted \_\_\_\_\_ you for the help you gave me at a time when I was ignored by even my close relatives.
- (a) to
  - (b) in
  - (c) off
  - (d) for
  - (e) down
  - (f) on
- (A) bca
  - (B) bea
  - (C) eca
  - (D) fcd
  - (E) fed

To 'hand in' is a phrasal verb that means to give something to a person in authority. To 'turn down' is to reject something. One is 'in someone's debt' but is 'indebted to someone'.

The correct answer is B.

29. (1) He was so fed up \_\_\_\_\_ the complaints about the incorrect bills.  
 (2) \_\_\_\_\_ such economic instability, it is true that the finance ministry puts in place some strict policies.  
 (3) Even if you explain \_\_\_\_\_ your use of foul language, I will not be able to forgive you for it.
- (a) from  
 (b) of  
 (c) away  
 (d) off  
 (e) to  
 (f) with
- (A) abc  
 (B) bac  
 (C) cdd  
 (D) ede  
 (E) ffc

The correct grammatical usage is 'fed up with'. The second blank also requires 'with'. To 'explain away' is to get rid of an accusation or a fault by means of explanation and justification.

The correct answer is E.

Directions for Questions 30–31: Choose the word or set of words for each blank that best fits the meaning of the sentence as a whole.

30. The students displayed their \_\_\_\_\_ nature when asked to gather in the ground at the specified time, but were \_\_\_\_\_ with their demand for waiving the minimum attendance to be able to take the exam.
- (A) respect .....kind  
 (B) obedient .....persistent  
 (C) insincere .....sarcastic  
 (D) subservient .....towering  
 (E) obsequiousness .....vigorous

The use of 'but' indicates that the ideas conveyed have to be contrasting in nature. This eliminates options A and C. All the other options, except option B, render the sentence grammatically incorrect.

The correct answer is B.

31. But the dawn of the \_\_\_\_\_ of Homo-sapiens is clothed in mystery, and experts have long \_\_\_\_\_ over the matter.
- (A) ancestry, fought  
 (B) heredity, clothed  
 (C) lineage, puzzled  
 (D) parentage, quarreled  
 (E) pedigree, thought

The only option that conveys the intended idea coherently, while maintaining the logical structure of the sentence, is option C.

The correct answer is C.

32. Choose the word or pair of words that best completes the relationship to the given pair: Epistle : letter :: \_\_\_\_\_ : \_\_\_\_\_
- (A) elegy : depressed  
 (B) epithet : depiction  
 (C) epitaph : true  
 (D) lyrics : writer  
 (E) ode : poem

An epistle is another name for a letter. The only option that reiterates this synonymous relation is option E. An ode is a lyrical poem with an irregular metric form. It is used to convey strong positive emotions.

The correct answer is E.

# Quantitative Skills

1. At a nature trail camp, one-fifth of the total members went rock climbing; twice the square root of the total members went hiking up a mountain trail. The remaining 10 were exploring in caves. How many members went hiking?

(A) 5  
(B) 10  
(C) 15  
(D) 20  
(E) 25

Suppose the total number of members is  $x$ .

Then, the number of members who went for rock climbing =  $\frac{1}{5}x$

The number of members who went for hiking up a mountain trail =  $2\sqrt{x}$

Therefore, the number of remaining members =  $x - \left(\frac{1}{5}x + 2\sqrt{x}\right)$

According to the question,

$$x - \left(\frac{1}{5}x + 2\sqrt{x}\right) = 10$$

$$\Rightarrow \left(\frac{4}{5}x - 2\sqrt{x}\right) = 10$$

$$\Rightarrow (4x - 10\sqrt{x}) = 50$$

$$\Rightarrow 2x - 5\sqrt{x} - 25 = 0$$

Putting  $2\sqrt{x} = y$ , we get

$$2y^2 - 5y - 25 = 0$$

On solving, we get  $y = 5$

$$x = 25$$

Therefore, the number of members who went for hiking up a mountain trail =  $2\sqrt{x} = 2 \times 5 = 10$

The correct answer is B.

2. If 201 digits were used to number the pages of a book, starting from 1, find the number of pages in the book.

(A) 100  
(B) 103  
(C) 105  
(D) 107  
(E) Cannot be determined

The number of digits used to number the pages from 1 to 9 = 9

The number of digits used to number the pages from 10 to 99 =  $90 \times 2 = 180$

Therefore, the total number of digits used to number the pages from 1 to 99 =  $9 + 180 = 189$

Now, the number of digits left =  $201 - 189 = 12$

Hence, the number of 3 digit numbers that were

written with 12 digits =  $\frac{12}{3} = 4$  (100, 101, 102 and 103)

Therefore, the number of pages in the book = 103.

The correct answer is B.

3. Which of the following numbers is divisible by 9?

(A) 1,203  
(B) 2,256  
(C) 42,651  
(D) 71,623  
(E) 92,423

We know that the divisibility rule of 9 says that the sum of the digits of the number should be divisible by 9.

Looking at the options,

The sum of the digits of 1,203 =  $1 + 2 + 0 + 3 = 6$  which is not divisible by 9

The sum of the digits of 2,256 =  $2 + 2 + 5 + 6 = 15$  which is not divisible by 9

The sum of the digits of 42,651 =  $4 + 2 + 6 + 5 + 1 = 18$  which is divisible by 9

The sum of the digits of 71,623 =  $7 + 1 + 6 + 2 + 3 = 19$  which is not divisible by 9

The sum of the digits of 92,423 =  $9 + 2 + 4 + 2 + 3 = 20$  which is not divisible by 9

Therefore, 42,651 is divisible by 9.

The correct answer is C.

4. Two natural numbers,  $m$  and  $n$ , are such that their least common multiple is 300. How many pairs of these numbers ( $m$  and  $n$ ) are possible?

(A) 37  
(B) 38

- (C) 70  
(D) 75  
(E) None of the above

Given that the LCM of  $m$  and  $n = 300$

$$300 = 2^2 \times 3^1 \times 5^2$$

$$\text{Taking } m = 2^a 3^b 5^c$$

$$\text{And, } n = 2^d 3^e 5^f,$$

$$\text{LCM of } m \text{ and } n = 2^i 3^j 5^k$$

$$\text{Where } i = \max(a, d) = 2,$$

$$j = \max(b, e) = 1,$$

$$k = \max(c, f) = 2$$

For  $\max(a, d) = 2$ , we have 5 options of  $(a, d)$   
 $= (0, 2), (2, 0), (2, 1), (1, 2)$  and  $(2, 2)$

Similarly,

For  $\max(b, e) = 1$ , we have 3 options

For  $\max(c, f) = 2$ , we have 5 options

Therefore, the total number of possible pairs  $= 5 \times 3 \times 5 = 75$

The correct answer is D.

5. How many odd factors do  $8!$  have?

- (A) 3  
(B) 4  
(C) 7  
(D) 9  
(E) 12

$$8! = 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 2^7 \times 3^2 \times 5^1 \times 7^1$$

We are interested to find the odd factors only. So the factors cannot contain 2. The factors can have 3, 5 and 7.

Now, there are 3 ways of choosing 3, 2 ways of choosing 5 and 2 ways of choosing 7.

Therefore, the total number of odd factors of  $8!$   
 $= 3 \times 2 \times 2 = 12$

The correct answer is E.

6. Which of the following is equivalent to

$$\log \frac{\left( \frac{a^i}{\sqrt{b^3 c}} \right)^{\frac{1}{4}}}{\left( \frac{a^2 b^3}{c^3} \right)^{\frac{1}{4}}}$$

- (A)  $\log a - 2 \log b$

$$(B) \frac{1}{3} \log a + \frac{1}{2} \log c$$

$$(C) \log a - \log b$$

$$(D) \frac{1}{2} \log a + \frac{1}{3} \log b - \log c$$

$$(E) \frac{1}{2} \log a - \frac{1}{3} \log b + \log c$$

$$\begin{aligned} \log \frac{\left( \frac{a^i}{\sqrt{b^3 c}} \right)^{\frac{1}{4}}}{\left( \frac{a^2 b^3}{c^3} \right)^{\frac{1}{4}}} &= \log \left[ \frac{a^{\frac{i}{4}}}{\sqrt{b^3 c}} \times \left( \frac{c^3}{a^2 b^3} \right)^{\frac{1}{4}} \right] \\ &= \log \left[ \frac{a^{\frac{i}{4}}}{b^{\frac{3}{4}} c^{\frac{1}{4}}} \times \left( \frac{c^{\frac{3}{4}}}{a^{\frac{1}{2}} b^{\frac{3}{4}}} \right)^{\frac{1}{4}} \right] \\ &= \log \left[ \frac{a^{\frac{i}{4}}}{b^{\frac{3}{4}} c^{\frac{1}{4}}} \times \frac{c^{\frac{3}{16}}}{a^{\frac{1}{8}} b^{\frac{3}{16}}} \right] \\ &= \log \left( \frac{a^{\frac{i}{4}}}{b^{\frac{13}{8}} c^{\frac{1}{8}}} \right) \\ &= \log a - \log b^2 \\ &= \log a - 2 \log b \end{aligned}$$

The correct answer is A.

7. In a school, 600 students took a common entrance test. Out of those who took the test, 75% of girls and 60% of boys cleared the test. The total pass percentage of students clearing the test is 70%. How many boys attempted the test?

- (A) 100  
(B) 200  
(C) 250  
(D) 350  
(E) 500

Suppose the number of boys who attempted the test is  $x$ ,

Then, the number of girls who attempted the test will be  $(600 - x)$ .

According to the question,

$$60\% \text{ of } x + 75\% \text{ of } (600 - x) = 70\% \text{ of } 600$$

$$\Rightarrow \frac{3}{5}x + \frac{3}{4}(600 - x) = 420$$

$$\Rightarrow \frac{3}{5}x + 450 - \frac{3}{4}x = 420$$

$$\Rightarrow 30 = \frac{3x}{20}$$

$$\Rightarrow x = 200$$

Therefore, the number of boys who attempted the test = 200

The correct answer is B.

8. Vinay invested an equal amount of money in two bonds. After 2 years, he received a simple interest of Rs 600 from the first bond and a compound interest of Rs 606 from the second bond. If the rate of interest was the same for both the bonds, what was the total amount of money that Vinay had invested in the two bonds?

- (A) 15,000  
(B) 30,000  
(C) 60,000  
(D) 1,20,000  
(E) 2,40,000

Given that the simple interest,  
SI = Rs. 600

And the compound interest, CI = Rs. 606

Let the rate of interest be  $R\%$  p.a.

Then total simple interest in 2 years =  $2R\%$  (of P)

Total compound interest in 2 years can be obtained by successive percentage formula as taking it as 2

$$\text{successive interest rates of } R\% = R + R + \frac{R^2}{100} = 2R + \frac{R^2}{100} \% \text{ (of P)}$$

$$\text{So the ratio of CI and SI for two years, } \frac{CI}{SI} = \frac{200 + R}{200}$$

On putting the values, we get,

$$\Rightarrow \frac{606}{600} = \frac{200 + R}{200}$$

$$\Rightarrow 606 \times 200 = 600(200 + R)$$

$$\Rightarrow 606 \times 200 = 600 \times 200 + 600R$$

$$\Rightarrow 200(606 - 600) = 600R$$

$$\Rightarrow R = 200 \times \frac{6}{600}$$

$$\Rightarrow R = 2\%$$

$$\text{Now, SI} = \frac{(P \times R \times T)}{100}$$

$$\Rightarrow 600 = \frac{P \times 2 \times 2}{100} \times$$

$$\Rightarrow P = 15000$$

It means that Vinay invested Rs. 15000 each in the two bonds.

Therefore, the total amount of money that Vinay had invested in the two bonds = Rs. 30000

The correct answer is B.

9. The capital of a company, Estyle, is made of 75,000 preferred shares with a dividend of 15% and 20,000 common shares, with the par value of each type of share at Rs 10. The total profit of Estyle was Rs 2,40,000 of which Rs. 40,000 was kept in a reserve fund. The remaining profit was distributed to the shareholders. What would be the difference in the dividend percentage given to the common shareholders if the amount kept away in the reserve fund was reduced to Rs 25,000?

- (A) 5.75%  
(B) 7.5%  
(C) 10%  
(D) 12.75%  
(E) 15%

#### Case 1

Total profit is Rs. 2,40,000 and Rs. 40,000 is kept in reserve fund. So, the fund available to distribute among the shareholders is Rs. 2,00,000.

Profit to be given to preference shareholders is 15% of 75000 preference shares of Rs. 10 each.

Therefore, the total amount to be distributed as dividend of preference shareholders is 15% of  $(10 \times 75,000) = \frac{15}{100} \times 10 \times 75,000 = \text{Rs. } 1,12,500$ .

So, dividend to be distributed to equity shareholders is Rs. 2,00,000 - Rs. 1,12,500 = Rs. 87,500.

Now, as there are 20,000 equity shares of Rs. 10 par value each, the total equity share capital is Rs. 2,00,000.

Therefore, dividend percentage of equity

$$\text{shareholders is } \frac{87500}{200000} \times 100 = 43.75\%$$

#### Case 2

Total profit is again Rs. 2,40,000 and Rs. 15,000 is kept as reserve fund. So, the amount to be distributed as dividend is Rs. 2,15,000

The share of preference shareholder is still Rs. 1,12,500

Now, the profit to be distributed to equity shareholders is Rs. 2,15,000 - Rs. 1,12,500 = 1,02,500.

So, the dividend percentage of equity shareholders is

$$\frac{1,02,500}{2,00,000} \times 100 = 51.25\%$$

Therefore, the difference in the dividend percentage given to the common shareholders =  $51.25\% - 43.75\% = 7.5\%$

**Alternatively**

The total profit and dividend to preference shareholders remains the same in both scenarios. In case 2, we need to keep Rs. 15,000 less in reserve fund. Therefore, equity shareholder will get Rs. 15,000 more in the 2<sup>nd</sup> case.

This results in  $\frac{15000}{10 \times 20000} \times 100\% = 7.5\%$

**The correct answer is B.**

10. Find a number which when added to both terms of the ratio 17 : 23 makes it equal to 10 : 13 so that the difference between the terms of the first ratio and the difference between the terms of the second ratio remains the same?

(A) 1  
(B) 3  
(C) 5  
(D) 6  
(E) 9

Suppose the number added to both the terms of the ratio 17 : 23 is x.

According to the question,

$$\left(\frac{17+x}{23+x}\right) = \frac{10}{13}$$

$$\Rightarrow 13(17+x) = 10(23+x)$$

$$\Rightarrow 13 \times 17 + 13x = 10 \times 23 + 10x$$

$$\Rightarrow 3x = 230 - 221$$

$$\Rightarrow x = 3$$

Therefore, the required number is 3.

**The correct answer is B.**

11. Swati had three cartons of books. The average price of the books in Carton 1 was Rs 64, the average price of the books in Carton 2 was Rs 82, and the average price of the books in Carton 3 was Rs 95. The average price of all the books in Carton 1 and Carton 2 together was Rs 78 and the average price of all the books in Carton 2 and Carton 3 together was Rs 90. What was the average price of the books in the three cartons?

(A) Rs 68.37  
(B) Rs 75.21  
(C) Rs 87.43  
(D) Rs 90.25  
(E) Rs 92.24

The average price of the books in Carton 1 = Rs 64  
The average price of the books in Carton 2 = Rs 82  
The average price of the books in Carton 3 = Rs 95  
The average price of all the books in Carton 1 and Carton 2 together = Rs 78

The average price of all the books in Carton 2 and Carton 3 together = Rs 90

Using the alligation rule, we have,

The ratio of the number of books in Carton 1 to that of Carton 2 =  $\left(\frac{82-78}{78-64}\right) = 2:7$

**Similarly,**

The ratio of the number of books in Carton 2 to that of Carton 3 =  $\left(\frac{95-90}{90-82}\right) = 5:8$

Hence, the ratio of the number of books in Carton 1, 2 and 3 = 10 : 35 : 56

Therefore, the average price of the books in the three cartons

$$\begin{aligned} &= \left(\frac{64 \times 10 + 82 \times 35 + 95 \times 56}{10 + 35 + 56}\right) \\ &= \left(\frac{640 + 2870 + 5329}{101}\right) \\ &= \frac{2839}{101} = 87.43 \end{aligned}$$

**The correct answer is C.**

12. FDB Builders was awarded the contract to construct a bridge. The company employed 100 workers to finish the work in 120 days. When four-fifths of the work was completed in 80 days, the company wanted to reduce the number of workers. How many workers can be let go without affecting the completion schedule of the construction of the bridge?

(A) 25  
(B) 40  
(C) 50  
(D) 65  
(E) 75

100 workers completed four-fifths, that is, 80% of the total work in 80 days.

Therefore, it will take 20 days more for 100 workers to complete the remaining 20% work.

As the work has to be completed in 40 days, that is, the number of days is doubled; then the number of workers should be halved.

Hence, the builders can let go of 50 workers.

The correct answer is C.

13. A pump can be used for filling as well as emptying a tank. The capacity of the tank is  $1,500 \text{ m}^3$ . The emptying capacity of the tank is  $10 \text{ m}^3$  per minute higher than its filling capacity and the pump needs 5 minutes less to empty the tank than it needs to fill it. What is the emptying capacity of the tank?

- (A)  $10 \text{ m}^3$  per minute  
(B)  $30 \text{ m}^3$  per minute  
(C)  $40 \text{ m}^3$  per minute  
(D)  $50 \text{ m}^3$  per minute  
(E)  $60 \text{ m}^3$  per minute

Suppose the filling capacity of the tank =  $x \text{ m}^3$  per minute

According to the question,

$$\frac{1500}{x} - \frac{1500}{(x+10)} = 5$$

$$\Rightarrow \frac{\{1500(x+10) - 1500x\}}{\{x(x+10)\}} = 5$$

$$\Rightarrow x^2 + 10x - 3000 = 0$$

$$\Rightarrow x^2 + 60x - 50x - 3000 = 0$$

$$\Rightarrow x(x+60) - 50(x+60) = 0$$

$$\Rightarrow x = -60, 50$$

Therefore, the emptying capacity of the tank  
 $50 + 10 = 60 \text{ m}^3$  per minute

The correct answer is E.

14. In a race, two wagons start off from the same point but travel in opposite directions. One travels at 80 mph. Two hours after starting, the wagons are 240 miles apart. What is the other wagon's speed in miles per hour?

- (A) 30 mph  
(B) 35 mph  
(C) 40 mph  
(D) 45 mph  
(E) 50 mph

The speed of the first wagon = 80 mph

So, the distance travelled by the first wagon in two hours = 160 miles

The distance between two wagons after two hours = 240 miles

Hence, the distance travelled by the second wagon in two hours =  $240 - 160 = 80$  miles

Therefore, the speed of the second wagon =  $\frac{80}{2} = 40$  mph

The correct answer is C.

15. If  $3a + \frac{1}{5a} = 3$ , then what is the value of

$$25a^2 + \frac{1}{9a^2}?$$

(A)  $\frac{17}{3}$

(B) 9

(C)  $\frac{65}{3}$

(D) 25

(E)  $\frac{85}{3}$

Multiplying both sides of the equation by  $\frac{5}{3}$ , we get

$$5a + \frac{1}{3a} = 5$$

Squaring both the sides,

$$25a^2 + \frac{1}{9a^2} + 2 \times 5a \times \frac{1}{3a} = 25$$

$$25a^2 + \frac{1}{9a^2} = 25 - \frac{10}{3} = \frac{65}{3}$$

The correct answer is C.

16. What is the sum of the products:  $1 \times 2 \times 3$ ;  $2 \times 3 \times 4$ ; ...;  $50 \times 51 \times 52$ ?

(A) 16, 56, 944

(B) 17, 56, 944

(C) 17, 56, 950

(D) 17, 56, 964

(E) 17, 56, 966

$$T_n = n(n+1)(n+2)$$

$$= n(n^2 + 3n + 2)$$

$$T_n = n^3 + 3n^2 + 2n$$

$$Sn = \sum_{n=0}^{50} (n^3 + 3n^2 + 2n)$$

$$= \left[ \frac{n(n+1)}{2} \right]^2 + 3 \left[ \frac{n(n+1)(2n+1)}{6} \right] + 2 \left[ \frac{n(n+1)}{2} \right]$$

$$\left[ \frac{50 \times 51}{2} \right]^2 + 3 \left[ \frac{50 \times 51 \times 101}{6} \right] + 2 \left[ \frac{50 \times 51}{2} \right]$$



$$= 1625625 + 128775 + 2550$$

$$= 1756950$$

The correct answer is C.

17. If  $\log_x a$ ,  $\log_y a$  and  $\log_z a$  are in H.P., then  $x$ ,  $y$  and  $z$  are in:

- (A) A.G.P.  
(B) A.P.  
(C) G.P.  
(D) H.P.  
(E) Cannot be determined.

As  $\log_x a$ ,  $\log_y a$  and  $\log_z a$  are in H.P., we have

$$\frac{2}{\log_y a} = \frac{1}{\log_x a} + \frac{1}{\log_z a}$$

$$\Rightarrow \frac{2 \log y}{\log a} = \frac{\log x}{\log a} + \frac{\log z}{\log a}$$

$$\Rightarrow 2 \log y = \log x + \log z$$

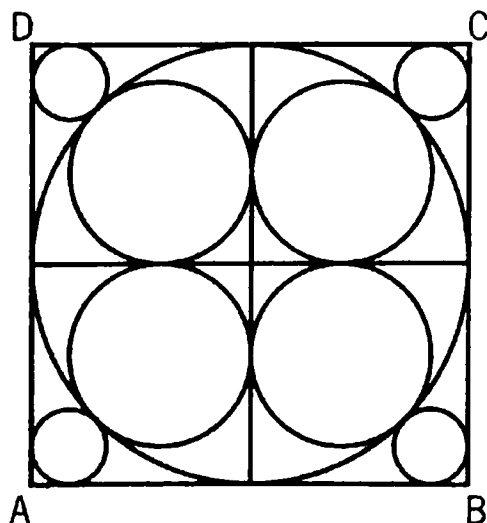
$$\Rightarrow \log y^2 = \log xz$$

$$\Rightarrow y^2 = xz$$

Therefore,  $x$ ,  $y$  and  $z$  are in GP.

The correct answer is C.

18. What is the sum of the radius of the three types of circles given in the figure below, if the side of the square  $ABCD$  is 4 cm?



- (A)  $\frac{4\sqrt{2}-4}{\sqrt{2}+1}$  cm  
(B)  $\frac{2\sqrt{2}+2}{\sqrt{2}+1}$  cm

- (C)  $\frac{4\sqrt{2}+2}{\sqrt{2}+1}$  cm  
(D)  $\frac{8\sqrt{2}+2}{\sqrt{2}+1}$  cm  
(E)  $\frac{2\sqrt{2}+2}{\sqrt{2}-1}$  cm

The radius of the biggest circle is 2. Hence, the answer should be more than 2.

Now the diagonal of the fourth part of the square is  $2\sqrt{2}$  and half of that is  $\sqrt{2}$ .

So, our answer must be less than  $2 + \sqrt{2}$ .

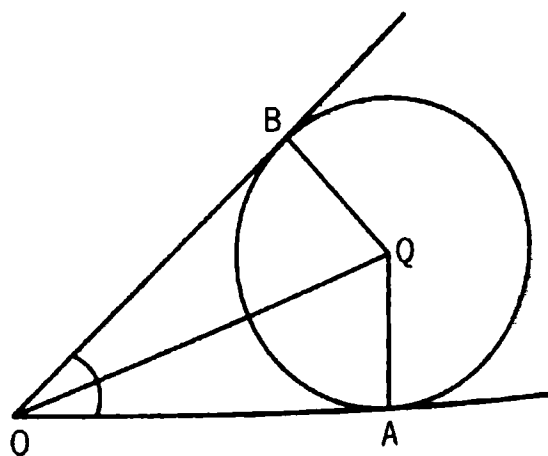
Therefore, the range of possible values for the sum of the radius of 3 circles is between 2 and  $\sqrt{2} = 1.4$  and, hence, between (2, 3.414)

Now, options A, B, C, D and E are nearly 0.66, 2, 3.17, 5.5 and 11 (for the sake of simplicity we may assume  $\sqrt{2} = 1.4$ )

Now only option C lies within the range of (2, 3.414)

The correct answer is C.

19. In the figure below,  $Q$  is the centre of the circle.  $\angle AOB = 60^\circ$  and the radius of the circle is 14 inches. From  $O$ ,  $OA$  and  $OB$  are the tangents drawn to the circle at  $A$  and  $B$  respectively. Find the area of the quadrilateral  $OAQB$ , in sq inches, not covered by the circle.



- (A)  $169\left(\sqrt{3} - \frac{\pi}{3}\right)$   
(B)  $144\left(\pi - \frac{1}{2}\right)$

(C)  $144\pi$ (D)  $196\left(\sqrt{2} + \frac{\pi}{\sqrt{3}}\right)$ (E)  $196\left(\pi + \frac{1}{\sqrt{2}}\right)$ 

In right angled triangle OAQ,

We have, QA = 14 inches

$$\angle QOA = \frac{1}{2} \angle AOB = 30^\circ$$

$$\tan 30^\circ = \frac{QA}{OA}$$

$$= \frac{1}{\sqrt{3}} = \frac{14}{OA}$$

$$\Rightarrow OA = 14\sqrt{3}$$

Now, the area of the quadrilateral OAQB = 2 × Area of triangle OAQ

$$= 2 \times \frac{1}{2} \times OA \times QA = 14 \times 14\sqrt{3}$$

$$= 196\sqrt{3}$$

The area of minor sector

$$BOA = \frac{120}{360} \times \pi \times 14^2$$

$$= \frac{\pi}{3} \times 14^2$$

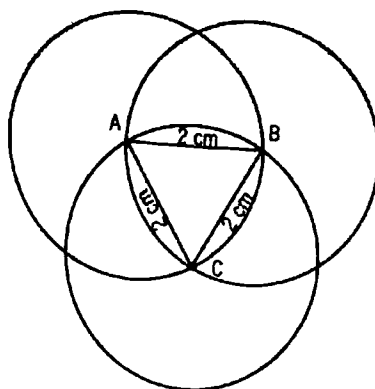
Therefore, the area of the quadrilateral OAQB, not covered by the circle

$$= 196\sqrt{3} - \frac{\pi}{3} \times 14^2$$

$$= 196\left(\sqrt{3} - \frac{\pi}{3}\right)$$

The correct answer is A.

20. Three equal circles of radius 2 cm intersect each other in such a way that each circle passes through the centres of the other two circles. Find the common area between the three circles.

(A)  $(\pi - \sqrt{3})$ (B)  $1.5(\pi - \sqrt{3})$ (C)  $2(\pi - \sqrt{3})$ (D)  $2.5(\pi - \sqrt{3})$ (E)  $3(\pi - \sqrt{3})$ 

Looking at the figure it is clear that the common area = Area (triangle ABC) + 3 × Area of segment AB

$$\text{Area of triangle, } ABC = \frac{\sqrt{3}}{4} a^2$$

Where 'a' is equal to the length of the radius of the circle.

Area of segment = Area of sector AB – Area of Triangle ABC

Hence, the common area =  $\frac{\sqrt{3}}{4} a^2 + 3$  (Area of sector AB – Area of Triangle ABC)

$$= \frac{\sqrt{3}}{4} \times 2^2 + 3 \left( \frac{60}{360} \pi \times 2^2 - \frac{\sqrt{3}}{4} \times 2^2 \right)$$

$$= 2\pi - 2\sqrt{3} = 2(\pi - \sqrt{3})$$

The correct answer is C.

21. Find the equation of the line passing through (23, 2) and perpendicular to the line  $6x + y - 15 = 0$ .

(A)  $6x + y - 140 = 0$ (B)  $6x - y - 136 = 0$ (C)  $6x + y + 15 = 0$ (D)  $x + 6y - 35 = 0$ (E)  $x - 6y - 11 = 0$ 

The equation of the line is

$$6x + y - 15 = 0$$

$$\Rightarrow y = -6x + 15$$

Therefore, the slope of the line  $y = -6x + 15$  is  $-6$

This means that the slope of the line perpendicular to the line  $y = -6x + 15$  is  $\frac{1}{6}$ .

Hence, the equation of the line having a slope of  $\frac{1}{6}$  and passing through the point (23, 2) is

$$y - 2 = \frac{1}{6}(x - 23)$$

$$\Rightarrow 6y - 12 = x - 23$$

$$\Rightarrow x - 6y - 11 = 0$$

The correct answer is E.

22. There are 12 holes made in the ground. At least 3 are to be filled with a red ball and the other holes can be filled with any colour ball. In how many different ways can all the holes be filled from a box of 5 red balls and 10 mixed colour balls?

- (A) 345  
(B) 425  
(C) 445  
(D) 465  
(E) 485

The number of red balls = 5

The number of mixed balls = 10

The required number of ways

= (3 red balls and 9 mixed balls) or (4 red balls and 8 mixed balls) or (5 red balls and 7 mixed balls)

$$= {}^5C_3 \times {}^{10}C_9 + {}^5C_4 \times {}^{10}C_8 + {}^5C_5 \times {}^{10}C_7$$

$$= 10 \times 10 + 5 \times 45 + 1 \times 120 = 445$$

The correct answer is C.

23. In a newly launched video game 'Shoot At Sight', each player is supposed to shoot at targets on the screen. For each hit, the score of the player gets doubled while for each miss, his score gets halved. Each player is given 10 shots at the targets. Each player starts with 100 points in his account initially. The game is over as soon as a player uses all his 10 shots. Two friends, Jai and Viru, played the game and finished with a total of 6,400 and 1,600 points respectively.

Which of the following could be Viru's total points after his 8<sup>th</sup> shot?

- (A) 200  
(B) 800  
(C) 1,000  
(D) 1,600  
(E) 3,200

Viru's final points after 10<sup>th</sup> shot = 1600

For 9<sup>th</sup> and 10<sup>th</sup> shoot, the possibilities are (hit, hit), (hit, miss), (miss, hit) or (miss, miss).

Looking at the options we can conclude that if Viru's score after his 8<sup>th</sup> shoot is 1600 and for last the two shoots—if he missed one shoot and hit the other shoot—then his score after the 10<sup>th</sup> shoot will remain 1600.

The correct answer is D.

Directions for Questions 24–27: Go through the given information and, based on it, solve the following questions: A construction project involves certain activities to be done for its completion. Details of these activities are given below.

Activity	Cost (Lakh Rupees)	Time Required (weeks)
X	7.5	6
Y	5	8
Z	10	4
A	12	10
B	9	5

Certain conditions are necessary as given below:

- Activity Z can only be done when activities X and Y are completed.
- No two activities can be done simultaneously.
- If any activity is delayed, it involves a penalty of 20%.

24. If suddenly it was realised that one more activity C is required for completing the project costing Rs 9 lakh, then what is the approximate percentage increase in the cost of the project?

- (A) 19.5%  
(B) 19.8%  
(C) 20.6%  
(D) 21.0%  
(E) 21.1%

The total cost of the project = (7.5 + 5 + 10 + 12 + 9) lakh = 43.5 lakh

The increase in the cost = 9 lakh

$$\text{The required percentage} = \frac{9}{43.5} \times 100 = 20.6\%$$

The correct answer is C.

25. Activity B was delayed by 2 weeks, activity Y by 1 week, while all other activities were completed as planned. If activity Z cost 25% more than prescribed, then what was the cost of the project and time taken to complete the project?

- (A) Rs 48.3 lakh and 35 weeks  
(B) Rs 48.8 lakh and 35 weeks  
(C) Rs 48.3 lakh and 36 weeks  
(D) Rs 48.8 lakh and 36 weeks  
(E) Rs 48.5 lakh and 37 weeks

According to the question, the modified cost and the time required would be:

Activity	Cost (Lakh Rs)	Time Required (Weeks)
X	7.5	6
Y	6	9
Z	12.5	4
A	12	10
B	10.8	7
Total	48.8	36

Therefore, the cost of the project and the time taken to complete the project were Rs 48.8 lakh and 36 weeks, respectively.

The correct answer is D.

26. If after performing activity Z, it was realised that activity B was to be performed before activity Z and now it is required to deconstruct Z, which would require 1 week and involve Rs 2 lakh, then what is the percentage change in the cost of the project?

- (A) 30%  
(B) 31.8%  
(C) 32.18%  
(D) 33%  
(E) 33.2%

The total cost of the project =  $(7.5 + 5 + 10 + 12 + 9)$  lakh = 43.5 lakh

The cost to deconstruct Z = 2 lakh

The cost to construct Z again = 10 lakh

The cost of the penalty involved for delaying activity Z = 20% of 10 lakh = 2 lakh

Hence, the total extra cost =  $2 + 10 + 2 = 14$  lakh

The required percentage =  $\frac{14}{43.5} \times 100 = 32.18\%$

The correct answer is C.

27. Activity Y takes 25% more time than prescribed for its completion and activity A has to be completed at the earliest opportunity. The project was started on February 1, 2012. If activity A has to be completed before activity Z because of certain constraints, when is the earliest possible day that activity Z can be started?

- (A) July 29, 2012  
(B) July 30, 2012  
(C) August 1, 2012  
(D) August 2, 2012  
(E) August 3, 2012

Activity Z can only be done when activities X and Y are completed and activity A has to be completed

before activity Z. Therefore, activity Z can be started only after completing activities A, X and Y.

The time taken to complete the activity A = 10 weeks

The time taken to complete the activity X = 6 weeks

The time taken to complete the activity Y =  $(8 + 25\%$  of 8) weeks = 10 weeks

Therefore, the total time taken to complete activities A, X and Y =  $(10 + 6 + 10)$  weeks = 26 weeks = 182 days.

As the project was started on February 1, 2012, so counting the days we have,

= 29 days (Feb) + 31 days (March) + 30 days (April) + 31 days (May) + 30 days (June) + 31 days (July) = 182 days

Therefore, the activity Z can be started on August 1, 2012.

The correct answer is C.

Directions for Questions 28-30: The following table gives the percentage breakdown of the total marks obtained by 5 students A, B, C, D and E in 6 subjects, P, Q, R, S, T and U, of their final exams. The maximum marks in each subject are 100 and every student got an integral score.

	P	Q	R	S	T	U
A	10	14	22	14	18	22
B	12	17	20	19	15	17
C	15	10	20	15	20	20
D	15	17	19	25	14	10
E	16	18	16	18	18	14

28. If out of these 5 students, E scored the highest marks in subject S, then his total score in all six subjects is definitely more than how many students?

- (A) 0  
(B) 1  
(C) 2  
(D) 3  
(E) 4

If E scored the highest marks in subject S, it means that 18% of the total marks scored by E are the highest among all the five students

That is

$18\% \text{ of } E_{\text{total}} > 14\% \text{ of } A_{\text{total}}$

$18\% \text{ of } E_{\text{total}} > 19\% \text{ of } B_{\text{total}}$

$$18\% \text{ of } E_{\text{total}} > 15\% \text{ of } C_{\text{total}}$$

$$18\% \text{ of } E_{\text{total}} > 25\% \text{ of } D_{\text{total}}$$

Therefore, from the above expressions, it can be concluded that E's total score in all six subjects is definitely more than the total score of B and D.

The correct answer is C.

29. What can be the maximum possible total score for C?

- (A) 400  
(B) 450  
(C) 500  
(D) 550  
(E) 600

The maximum marks in each subject are 100, so the total marks of the exam will be 600. Now, C must score 100 in each subject to score total 600 marks. But then the percentage value given must have been the same for each subject for C. Since C cannot score 600 marks, option (E) is eliminated.

Also, every student got an integral score. So, looking at the percentage of marks obtained by C, 550 cannot be the maximum marks.

Therefore, the correct answer is 500.

The correct answer is C.

30. If the pass marks in each subject are 20 and each student passed in all subjects, then what can be the minimum total score obtained by any of the 5 students?

- (A) 120  
(B) 150  
(C) 175  
(D) 200  
(E) 250

As the pass marks in each subject are 20 and each student passed in all subjects, the lowest percentage of marks scored by any student should be greater than 20.

$$\text{Therefore, } 10\% \text{ of } A_{\text{total}} > 20 \Rightarrow A_{\text{total}} > 200$$

$$\text{Similarly, } 12\% \text{ of } B_{\text{total}} > 20 \Rightarrow B_{\text{total}} > 166$$

$$10\% \text{ of } C_{\text{total}} > 20 \Rightarrow C_{\text{total}} > 200$$

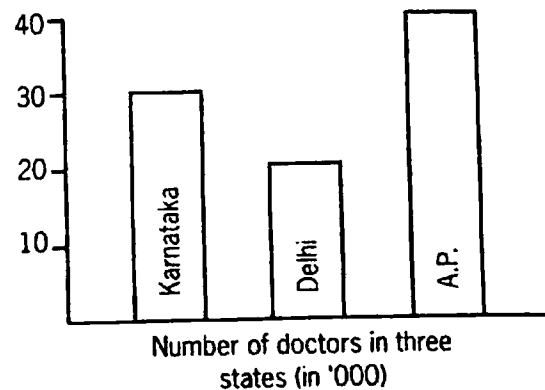
$$10\% \text{ of } D_{\text{total}} > 20 \Rightarrow D_{\text{total}} > 200$$

$$14\% \text{ of } E_{\text{total}} > 20 \Rightarrow E_{\text{total}} > 142$$

Hence, the minimum total score obtained should be greater than 142. Looking at the options, 150 is the correct answer.

The correct answer is B.

Directions for Questions 31-34: Use the following charts, which show the data of professionals in different functional areas of medicine in Karnataka, Delhi and A.P, to answer the given question.



Area	Karnataka (%)	Delhi (%)	A.P (%)
Dentist	50	37 1/2	25
Physician	25	37 1/2	25
Surgeon	12 1/2	12 1/2	18 1/4
Specialists	12 1/2	12 1/2	31 1/4

31. What is the number of physicians in A.P?

- (A) 8,000  
(B) 8,900  
(C) 9,200  
(D) 10,000  
(E) 12,000

$$\begin{aligned} \text{The number of physician in AP} &= 25\% \text{ of } 40000 = \frac{1}{4} \\ &\times 40000 = 10000 \end{aligned}$$

The correct answer is D.

32. What is the ratio of the number of dentists in Karnataka to that in Delhi?

- (A) 1:2  
(B) 1:3  
(C) 2:1  
(D) 3:1  
(E) 3:5

The ratio of the number of dentists in Karnataka to that in Delhi

$$= \left( \frac{50\% \text{ of } 30000}{37.5\% \text{ of } 20000} \right) = \frac{15000}{7500} = 2:1$$

The correct answer is C.

33. If the number of dentists in A.P increases by 10% and that in Delhi remains the same, then what is the ratio of the number of dentists in A.P to that in Delhi?

- (A) 11:30  
(B) 22:13  
(C) 22:15  
(D) 30:11  
(E) 35:11

The number of dentists in AP after 10% increase

$$= 0.1 \times \frac{1}{4} \times 40000 = 11000$$

$$\text{The required ratio} = \frac{11000}{7500} = 22:15$$

The correct answer is C.

34. What is the percentage difference between the number of specialists in Karnataka and that in Delhi?

- (A) 0%  
(B) 50%  
(C) 100%  
(D) 150%  
(E) 180%

The number of specialists in Karnataka = 12.5% of 30000 = 3750

The number of specialists in Delhi = 12.5% of 20000 = 2500

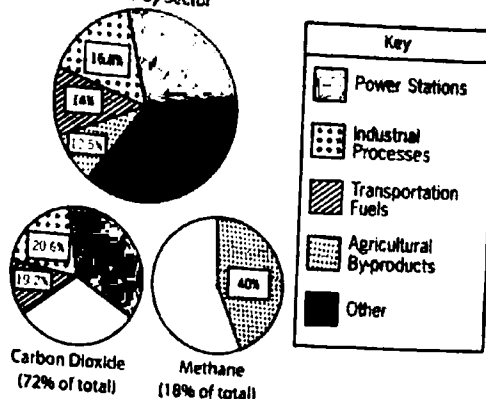
The required percentage difference

$$= \left( \frac{3750 - 2500}{2500} \right) \times 100 = 50\%$$

The correct answer is B.

Directions for Questions 35–38: The total annual greenhouse gas emission in a country was 1,689 million tonnes in a certain year. Go through the given graphs and answer the questions based on them.

Annual Greenhouse Gas Emissions by Sector



35. A scientist has reported that 18.1% of the methane gas emitted annually is caused by waste disposal. If 9.7% of the greenhouse gases emitted annually by other sectors are caused by waste disposal, approximately how many million tonnes of greenhouse gases, other than methane, are emitted annually due to waste disposal?

- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5

The amount of greenhouse gases emitted annually caused by waste disposal is = 9.7% of 35.4% of 1689 = approximately 58 million tonnes.

The amount of methane gas emitted annually caused by waste disposal is = 18.1% of 18% of 1689 = approximately 55 million tonnes.

Therefore, the greenhouse gases, other than methane, emitted annually due to waste disposal is = 58 – 55 = 3 million tonnes.

The correct answer is C.

36. What was the total amount of methane gas emitted in the country that year from sources other than agricultural by-products?

- (A) 121.61 million tonnes  
(B) 134.71 million tonnes  
(C) 156.82 million tonnes  
(D) 182.41 million tonnes  
(E) 193.42 million tonnes

The total amount of methane gas emitted in the country that year from sources other than agricultural by-products = 18% of 60% of 1689 = 182.41

The correct answer is D.

37. Greenhouse gases consist of carbon dioxide, methane, nitrous oxide and other gases and 1.5% of the nitrous oxide is emitted from transportation fuels. If 1% of greenhouse gases are other gases, what is the difference between the total annual greenhouse gas emission from transportation fuels and the total nitrous oxide emission from transportation fuels?

- (A) 148.32 million tonnes  
(B) 152.01 million tonnes  
(C) 228.63 million tonnes  
(D) 234.20 million tonnes  
(E) 236.46 million tonnes

The content of carbon dioxide in greenhouse gas emissions = 72%

The content of methane in greenhouse gas emissions = 18%

The content of other gases in greenhouse gas emissions = 1%

Therefore, the content of nitrous oxide in greenhouse gas emissions =  $100 - (72 + 18 + 1) = 9\%$

The amount of nitrous oxide = 9% of 1689 = 152 million tonnes

The nitrous oxide emitted from transportation fuels = 1.5% of 152 = 2.28 million tonnes

Therefore, the required difference = 14% of  $1689 - 2.28 = 234.18$  million tonnes

**The correct answer is D.**

38. What percentage of the annual greenhouse gas emitted from industrial processes comprises of carbon dioxide gas emitted from industrial processes?

- (A) 75.3%  
(B) 78.8%  
(C) 80.6%  
(D) 85.8%  
(E) 88.3%

The annual greenhouse gas emitted from industrial processes = 16.8% of 1689 = 283.75

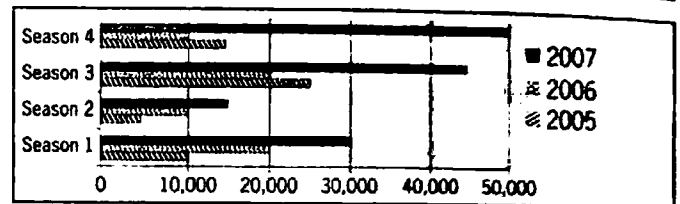
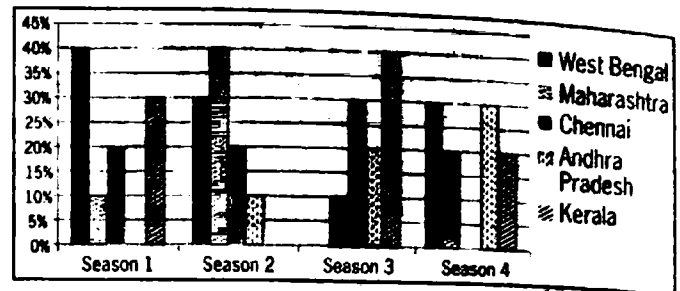
The carbon dioxide gas emitted from industrial processes = 20.6% of 72% of 1689 = 250.51

The required percentage =  $\frac{250.51}{283.75} \times 100 = 88.3\%$

**The correct answer is E.**

**Directions for Questions 39–42:** Go through the given graphs and, based on them, solve the following questions:

The given bar graphs represent the runs scored by the Karnataka Ranji team in domestic cricket. Bar chart 1 gives the details of the runs scored by Karnataka against each of the 5 states as a percentage of the total runs scored by Karnataka. Chart 2 gives the details of the runs scored in each of the four seasons of three different years.



39. Assume that the percentage breakup of the runs scored against each state in each season was the same for all three years.

Against which state did the Karnataka team score the maximum runs in the year 2005?

- (A) Kerala  
(B) Chennai  
(C) Maharashtra  
(D) West Bengal  
(E) Andhra Pradesh

The maximum runs in 2005 were scored in season 3 (25,000) against Kerala. (40%)

**The correct answer is A.**

40. What was the percentage change in the runs scored against Chennai from 2005 to 2006?

- (A) 14.3%  
(B) 17.2%  
(C) 18.2%  
(D) 20.2%  
(E) 33.2%

The runs scored against Chennai in the year 2005:

Season 1 = 20% of 10,000 = 2000

Season 2 = 20% of 5,000 = 1000

Season 3 = 30% of 25,000 = 7500

Season 4 = 0

The total runs scored against Chennai in the year 2005 =  $2000 + 1000 + 7500 = 10,500$

The runs scored against Chennai in the year 2006:

Season 1 = 20% of 20,000 = 4,000

Season 2 = 20% of 1,000 = 2,000

Season 3 = 30% of 20,000 = 6,000

Season 4 = 0

The total runs scored against Chennai in the year 2006 =  $4,000 + 2,000 + 6,000 = 12,000$

Therefore, the percentage change =  $\frac{(12,000 - 10,500)}{10,500} \times 100 = 14.29\% = 14.3\%$  approx.

The correct answer is A.

41. In which year and season did the runs scored against Maharashtra show the maximum change over the previous season in the year?

- (A) Season 3, year 2005
- (B) Season 4, year 2005
- (C) Season 2, year 2006
- (D) Season 2, year 2007
- (E) Season 4, year 2007

In such types of questions we need not calculate all the values. We can solve the questions just by looking at the graphs. Here, if we can ascertain the season in which the maximum runs were scored, we will be able to arrive at the answer. Looking at graph 2, we can infer that the maximum runs were scored in season 4, of the year 2007. Therefore, E is the correct answer.

The correct answer is E.

42. Which of the following is the maximum difference between the runs scored against any two states in any season?

- (A) 12,000
- (B) 13,000
- (C) 14,500
- (D) 15,500
- (E) 18,000

Looking at graph 2, we can conclude that the highest number of runs was scored in season 3 and 4 of 2007. Now from graph 1 it can be concluded that the highest percentage of the total score was made by Karnataka in season 3 of the year 2007, against Kerala.

Therefore, the runs scored by Karnataka against Kerala in 2007 in season 3 = 40% of 45,000 = 18,000

And the runs scored by Karnataka against West Bengal in 2007 in season 3 = 0 (match not played)

Hence, the required difference = 18,000

The correct answer is E.

**Directions for Questions 43–48:** A question is followed by two statements, labelled (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

Select from the following choices:

- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
  - (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
  - (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
  - (D) EACH statement ALONE is sufficient.
  - (E) Statements (1) and (2) TOGETHER are not sufficient.
43. The sum of the ages of three persons A, B and C is 167 years. What is the age of B?

(1) B is  $\frac{17}{12}$  times as old as A.

(2) C is 44 years older than A.

Given that  $A + B + C = 167$

**From Statement 1:**

$$B = \frac{17}{12} A$$

There is no clue about the age of C. Therefore, the age of B cannot be determined.

**From Statement 2:**

$$C = A + 44$$

There is no clue about the age of B. Therefore, the age of B cannot be determined.

**Combining Statements 1 and 2:**

$$B = \frac{17}{12} A$$

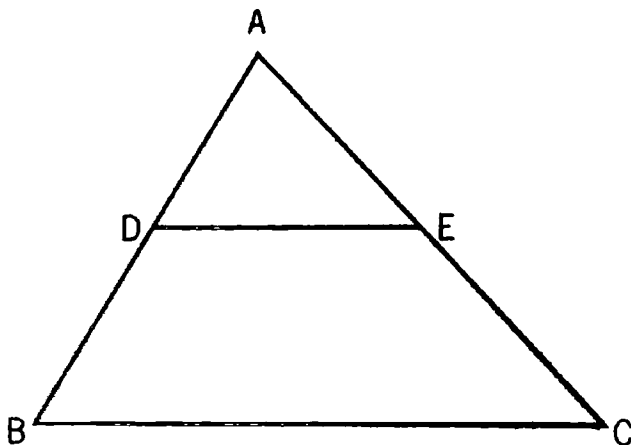
$$C = A + 44$$

On putting the values of B and C in the main equation, the value of B can be calculated. Hence, both statements together are sufficient to solve the question, but neither statement is sufficient alone.

The correct answer is C.



44. The following picture shows a triangle ABC. A line is drawn so that it divides the other two sides at two distinct points D and E.



In triangle ABC, find the length of DE.

- (1) The length of side BC is 6 cm and DE is parallel to BC.
- (2) Triangle ABC is a scalene triangle.

**From Statement 1:**

$BC = 6$  cm

Since BC is parallel to DE, we have,

$$\frac{AB}{AD} = \frac{AC}{AE} = \frac{BC}{DE}$$

So the value of DE cannot be calculated. Hence statement (1) alone is not sufficient.

**From Statement 2:**

Triangle ABC is a scalene triangle, that is, it has three unequal sides. Using this information the value of DE cannot be calculated. Hence statement (2) alone is not sufficient.

**Combining Statements 1 and 2:**

From the above two statements we can conclude that the DE cannot be calculated. Hence, statements (1) and (2) together are not sufficient, and additional data is needed.

**The correct answer is E.**

45. A mobile phone operator charges his customers on a monthly basis an amount given by  $y = a + bx$ , where 'y' is the bill amount, 'a' is the fixed charge per month, 'b' is the variable charge per call and 'x' is the number of calls made. These rates came into force from January and were in force till 30<sup>th</sup> June.

From July, the variable charge is reduced by 50 paise per call and the fixed charge is increased by Rs 100

per month. What is the fixed charge charged by the company from 1<sup>st</sup> July, per month?

- (1) Mr. Anand who made 90 calls in January and 10 calls in February paid Rs 160 less in February than in January.
- (2) The amount paid by Mr. Anand for January and February together was 250% of the amount paid by him in February.

Suppose  $y_1$  and  $y_2$  are Anand's bill amounts for the months of January and February respectively.

**From Statement 1:**

$$y_1 = a + 90b$$

$$y_2 = a + 10b$$

$$y_1 - y_2 = 80b = 160$$

$$\Rightarrow b = 2$$

Therefore, the two equations are:

$$y_1 = a + 180$$

$$y_2 = a + 20$$

From the above two equations it is not possible to determine the value of 'a'. Hence statement (1) alone is not sufficient.

**From Statement 2:**

$$y_1 = 1.5y_2$$

Again it is not possible to determine the value of 'a'. Hence statement (2) alone is not sufficient.

**Combining Statements 1 and 2:**

$$1.5y_2 = a + 180$$

$$y_2 = a + 20$$

Now, by using the two linear equations, we can determine the value of 'a' that is the fixed charge levied by the company till 30<sup>th</sup> June. As the fixed charge is then increased by Rs 100 per month, we can calculate the revised fixed charge as well.

Hence, both statements together are sufficient, but neither statement alone is sufficient.

**The correct answer is C.**

46. Anshuman bought two articles from a sale and sold them to his friend Ankit. Did Anshuman make a profit or a loss?

- (1) Anshuman sold both the articles at the same price.
- (2) Of the two articles sold, Anshuman made a profit of  $p\%$  on one and incurred a loss of  $p\%$  on the other.

**From Statement 1:**

There is no information about the cost price of the two articles. Hence, statement (1) alone is not sufficient.

**From Statement 2:**

There is no information about the cost price and selling price of the two articles. Only profit and loss percentages are given. Hence, statement (2) alone is not sufficient.

**Combining Statements 1 and 2:**

We know that if a person sells an item at a profit of  $p\%$  and another item at a loss of  $p\%$ , the net result will always be a loss to that person of  $= (p/10)^2\%$  given that the selling price of both the articles is equal. Hence, both statements together are sufficient, but neither statement alone is sufficient.

The correct answer is C.

**47. Are the integers A and B co-primes?**

(1) The numbers A and B are the squares of two successive even numbers.

(2) Both A and B are distinct primes.

**From Statement 1:**

As A and B are the squares of two successive even numbers. So let us suppose,

$$A = (2n)^2 \Rightarrow A = 4n^2$$

$$B = (2n + 2)^2 \Rightarrow B = 4n^2 + 8n + 4 = 4(n^2 + 2n + 1)$$

Clearly, A and B are not co-primes. Hence statement (1) alone is sufficient.

**From Statement 2:**

As A and B are two distinct primes, there is no common factor between A and B and, therefore, their squares will also not have any common factor.

Hence, statement (2) alone is sufficient.

The correct answer is D.

**48. Is the product of the roots of the equation  $x^2 + bx + c = 0$  a rational number?**

**Statements:**

(1) Sum of the roots = 3.

(2) One of the roots is an irrational number.

If a and b are the roots of the equation  $x^2 + bx + c = 0$ , then we know

The sum of the roots =  $a + b$

And the product of the roots =  $ab$

**From Statement 1:**  $a + b = 3$

There is no clue about the product of the roots. Hence statement (1) alone is not sufficient.

**From Statement 2:**

Either a or b is an irrational number. Again, there is no clue about the product of the numbers. Hence, statement (2) alone is not sufficient.

**Combining Statements 1 and 2:**

Even on combining both the statement, we cannot say anything about the product of the roots. Hence, statements (1) and (2) together are not sufficient

The correct answer is E.

# Reasoning Skills

1. **Directions:** Read the following information and answer the question.

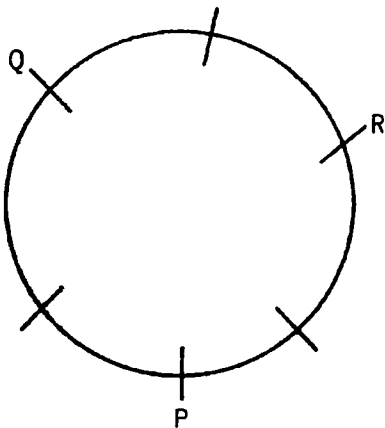
P, Q, R, S and T sit around a table.

P sits two seats to the left of R and Q sits two seats to the right of R.

If a new person U joins the group such that the initial conditions for the seating arrangement should be observed and also a new condition that U does not sit next to P, S or T be satisfied, then who will be the neighbours of P (one on either side)?

- (A) S and T  
(B) S and Q  
(C) T and R  
(D) R and Q  
(E) T and Q

The given information can be arranged as below:



From the figure drawn it is clear that Q and R cannot be the neighbours of P. Out of the options provided, only option (A) satisfies this condition.

**Alternatively (with the same diagram)** – As U is not a neighbour of P, S or T, U must be seated between Q and R. So, S and T will be neighbours of P.

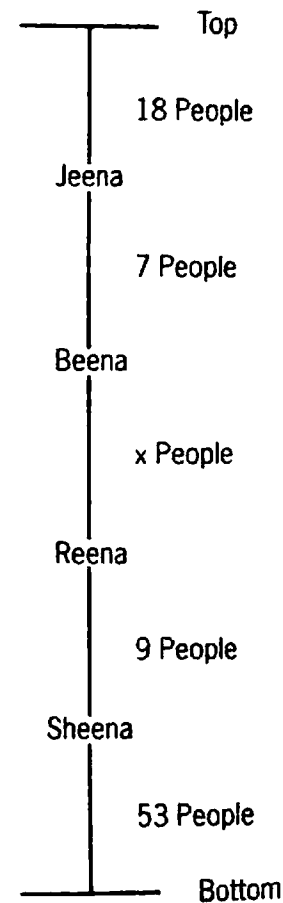
**The correct answer is A.**

2. If Jeena is placed 19<sup>th</sup> from the top and Sheena is placed 54<sup>th</sup> from the bottom and Beena is standing 8 places below Jeena and Reena is standing 10 places above Sheena, then how many people are standing between Beena and Reena if the total number of people in the column is 100?

- (A) 7  
(B) 9  
(C) 11  
(D) 15  
(E) 18

Suppose there are  $x$  people standing between Beena and Reena.

Now, the given information can be arranged as below:



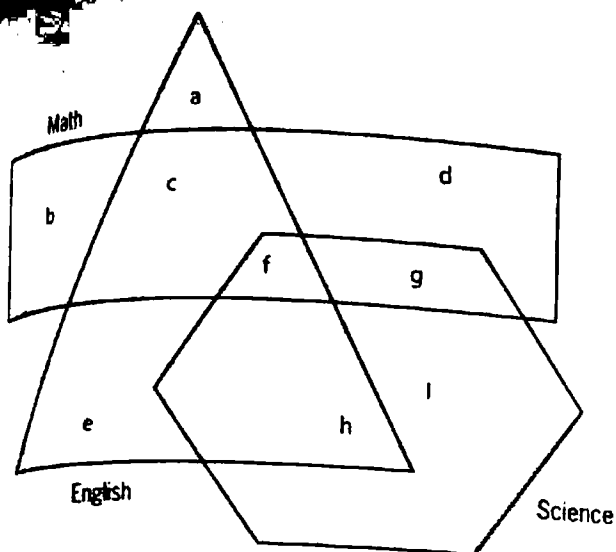
So, from the figure we have,

$$18 + 1 + 7 + 1 + x + 1 + 9 + 1 + 53 = 100$$

$$x = 9$$

**The correct answer is B.**

3. **Directions:** The given diagram represents the students who are studying Maths, English and Science



The students who are studying English and Maths but not Science are represented by:

- (A) a
- (B) b
- (C) c
- (D) d
- (E) g

Looking at the figure it is clear that the Students who study English and Maths but not Science are represented by the letter c.

The correct answer is C.

4. **Directions:** In the given question, there are five choices (A–E). Four of them are alike and one is different. Mark the one that is different.

- (A) adolescent
- (B) delinquent
- (C) jejune
- (D) juvenile
- (E) puerile

Adolescent, Jejune, Juvenile and Puerile convey similar meanings. Adolescent refers to a young person in the process of becoming an adult. Jejune indicates immature or childish conduct. Juvenile also relates to young people. Puerile is used to indicate silly, childish behaviour or speech that indicates a lack of good judgement. Delinquent, on the other hand, refers to a lawbreaker; a malefactor, that is, a person with a tendency to commit a crime.

The correct answer is B.

5. **Directions:** A statement is given followed by two assumptions numbered I and II. An assumption is something supposed or taken for granted. Consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement.

**Statement:** People need to find better ways to live life wisely.

**Assumptions:** I. People don't live life wisely.

**Assumptions:** II. People have ways to live life wisely.

- (A) Only Assumption I is implicit.
- (B) Only Assumption II is implicit.
- (C) Both assumptions I and II are implicit.
- (D) Either assumption I or II is implicit.
- (E) Neither assumption I nor II is implicit.

Only the second assumption is implicit in the given statement. The fact that people need to find better ways to live life wisely does not mean that they don't live wisely at present. However, it does include the assumption that there are certain ways available that can help people live wisely.

The correct answer is B.

6. **Directions:** A statement or more is followed by three courses of action numbered I, II and III. A course of action is a step or administrative decision to be taken for improvement, follow up or further action in regard to the problem, policy, etc. On the basis of the information given in the statement, assuming everything in the statement to be true, decide which of the suggested courses of action should logically be pursued.

**Statement:** One of the oldest aviation training facilities in the country, the Bombay Flying Club (BFC), is heading for closure. The flight operations of the club, started in the early 1920s, have been closed for the past 18 months. During this period not a single flight has taken off, since the club does not have a Chief Flying Instructor (CFI). Enrolled at a whopping fee of Rs 8 lakh for the Commercial Pilot Licence (CPL), some of the students have already shifted to other institutes to complete their course.

**Courses of Action:**

- I. Students should be discouraged from leaving the institute.
- II. Criminal proceedings for cheating (the students) should be initiated against the Flying Club.
- III. The Flying Club should procure more Cessna aircrafts to train the students.

- (A) Only I should be pursued.
- (B) Only II should be pursued.
- (C) Both I and II should be pursued.
- (D) All should be pursued.
- (E) None should be pursued.

A course of action has to recommend a plausible, practical and logical decision. In the given scenario, if the flight operations of the club have been closed for the past 18 months, then criminal proceedings should be initiated against the club as they have already charged a huge fee from the students. The first option shall prove detrimental for the students while the third option is irrelevant as the club does not have a Chief Flying Instructor. Hence, buying more aircrafts shall not solve the problem.

**The correct answer is B.**

7. **Directions:** Given alongside are a few facts. Based on these facts, select from among the given statements, the statement that can be concluded to be a fact.

**Facts:**

1. Prof Gupta from the Delhi College of Arts and Sciences wrote two books, one in the area of sociology of science and the other in the area of work sociology.
2. *Sociology of Sciences* is published by a foreign publisher.
3. Books published by Indian publishers are less expensive.

**Statements:**

- I. Sociology of Science is more expensive.
  - II. *Sociology of Work* is published by an Indian publisher.
  - III. *Sociology of Work* is priced high.
- (A) Statement II can be concluded.
  - (B) Statement III can be concluded.
  - (C) Statements I and II can be concluded.
  - (D) Statements I and III can be concluded.
  - (E) None of the statements can be concluded.

None of the conclusions can be drawn from the given set of facts. Statement 2 cannot be concluded as no information is given about the publisher of *Sociology of work*. Also, the use of 'less expensive' provides incomplete information. The facts do not provide a comparison, hence, statements I and III cannot be concluded.

**The correct answer is E.**

8. **Directions:** Given below is a statement followed by three arguments numbered I, II, and III. Decide which of the given arguments is strong and is able to support the given statement.

**Statement:** Smoking is injurious to health.

**Argument:**

- I. Many smokers are known to have died of heart and lung diseases.
  - II. More smokers die of cancer than non-smokers.
  - III. Smoking causes lung cancer.
- (A) Only Argument I is strong.
  - (B) Only Argument II is strong.
  - (C) Only Argument III is strong.
  - (D) Only Arguments II and III are strong.
  - (E) All of the arguments are strong.

All the three arguments provide strong support to the claim made in the main statement, as they reinforce it with more information.

**The correct answer is E.**

9. In a certain code language the word EMOTICON is coded as FNPUJDPO, how is DUBIOUS coded in the same language?

- (A) EVCJPVT
- (B) EVCKPVT
- (C) FWLDQWU
- (D) VEKCPVT
- (E) WLDQFUD

If EMOTICON is coded as FNPUJDPO, it can be seen that every letter of the word EMOTICON is replaced by its respective next letter of the English alphabet. Therefore, DUBIOUS will be coded as EVCJPVT.

**The correct answer is A.**

10. In a certain code language, RELINQUISH is coded as UHOLQPTHRG. How will OPTIMISTIC be coded in this language?

- (A) PQVOKRSBVO
- (B) QRSFLOPNDB
- (C) RSPOERHSPO
- (D) RSWLPHRSHB
- (E) RSWLPISTID

R	E	L	I	N	Q	U	I	S	H
↓+3	↓+3	↓+3	↓+3	↓+3	↓-1	↓-1	↓-1	↓-1	↓-1
U	H	O	L	Q	P	T	H	R	G
O	P	T	I	M	I	S	T	I	C
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
R	S	W	L	P	H	R	S	H	B

The correct answer is D.

11. If 'x' means '-', '+' means 'x', '-' means '÷' and '÷' means '+', find the value of  $\frac{12 \times 4 + 2 + 8 - 2}{4 + 3 - 1 \times 2 + 2}$

- (A)  $\frac{2}{3}$   
 (B)  $\frac{4}{3}$   
 (C)  $\frac{5}{3}$   
 (D)  $\frac{7}{3}$   
 (E)  $\frac{8}{3}$

Using the given information and applying BODMAS, we have,

$$\frac{12 - 4 + 2 \times 8 + 2}{4 \times 3 + 1 - 2 + 2} = \frac{12 - 4 + 2 \times 4}{4 \times 3 - 2 + 2}$$

$$= \frac{12 - 4 + 2 + 8}{12 - 2 + 2}$$

$$= \frac{16}{12} = \frac{4}{3}$$

The correct answer is B.

12. In a certain language, HUNIKA is coded as 93223 and TARITA is coded as 212127. What will be the code of NIVEDITA in this language?

- (A) 1529318  
 (B) 2915429  
 (C) 1429319  
 (D) 1415429  
 (E) 1529319

As per the position of alphabets in the English language, H = 8, U = 21, N = 14, I = 9, K = 11, A = 1

Now for the next step, just add the first and the last number, then the second and the second last number and so on till we get the middle number. So for HUNIKA we have:

$$\text{HUNIKA} = 8 + 1, 21 + 11, 14 + 9 = 93223$$

Similarly,

$$T = 20, A = 1, R = 18, I = 9, T = 20, A = 1$$

Therefore, the code for TARITA becomes

$$\text{TARITA} = 20 + 1, 1 + 20, 18 + 9 = 212127$$

Finally, the code for NIVEDITA becomes,

$$N = 14, I = 9, V = 22, E = 5, D = 4, I = 9, T = 20, A = 1$$

$$\text{NIVEDITA} = 14 + 1, 9 + 20, 22 + 9, 5 + 4 = 1529319$$

The correct answer is E.

Directions for Questions 13 – 16: Refer to the data below and answer the questions that follow.

- A wooden pyramid is kept on a table.
- Pictures of a zebra, a lion, an elephant, a fox and a deer are drawn, one each on all the four faces and its base.
- Each picture is painted in a different colour—blue, grey, black, yellow and brown.
- The lion—which is in a brown colour, is not on the opposite face of the black coloured picture.
- The deer is on the adjacent face of the blue coloured elephant.
- The colour of the picture of the zebra is not grey and it is opposite to the yellow coloured animal.
- The grey coloured picture is not on any of the faces.

13. Which of the following statements is not true?

- (A) The deer is blue.  
 (B) The zebra is black.  
 (C) The fox is not seen from any of the faces.  
 (D) Yellow and grey colours are not opposite to each other.  
 (E) None of these

Let us allot numbers to the sides of the pyramid—1, 2, 3 and 4 where sides 1 and 3 are opposite to each other and so are sides 2 and 4. We can start by giving any position from 1 to 4 to a picture of any animal (other than the grey coloured picture as it is not on any face) and arrange others according to given information. Let us start by giving side 4 to the lion's picture.

Therefore, according to the given information, the pictures of the coloured animals would look like:

	Animal	Colour
Side 1	Deer	Yellow
Side 2	Elephant	Blue
Side 3	Zebra	Black
Side 4	Lion	Brown
Base	Fox	Grey

Therefore, option (A) is not true.

**The correct answer is A.**

14. Which of these is the colour combination of the pictures on opposite faces?

- (A) brown – black  
(B) grey – black  
(C) yellow – black  
(D) yellow – brown  
(E) cannot be determined

Looking at the table drawn in question 13, the colour combination of the pictures on opposite faces 1 and 3 is Yellow – black.

**The correct answer is C.**

15. Which of the following animals are on the two adjacent faces of the lion?

- (A) deer – elephant  
(B) zebra – deer  
(C) zebra – elephant  
(D) zebra – fox  
(E) cannot be determined

The lion is on side number 4. Upon referring to the table, we can see that the two adjacent faces of the lion will be side number 3 and 1, that is, the zebra and the deer.

**The correct answer is B.**

16. If the location of the animal in grey is interchanged with that of the one in brown and the location of the animal in yellow is interchanged with that of the one in black, which combination of animals will be on the faces adjacent to the deer?

- (A) elephant – zebra  
(B) fox – elephant  
(C) fox – zebra  
(D) lion – elephant  
(E) zebra – lion

After interchanging the locations, the modified information will be as follow:

	Animal	Colour
Side 1	Zebra	Black
Side 2	Elephant	Blue
Side 3	Deer	Yellow
Side 4	Fox	Grey
Base	Lion	Brown

Now, the animals fox and elephant are on the faces adjacent to the deer.

**The correct answer is B.**

**Directions for Questions 17–20:** Based on the information given below, answer the questions given alongside.

The CM called 6 of his senior MLAs and asked them to apply for a position in one of the three departments—Home, Finance and Education. Every department was to have one Minister and one Deputy Minister. Every MLA was asked to write their choice of department and position. No two MLAs gave the same choice. After writing the choice, each MLA spoke one truth and one lie.

- A – Truth – Did not apply for Finance, Lie – Applied for Deputy Minister's position in Home  
B – Truth – Applied for Minister's position only, Lie – Applied for Home  
C – Truth – Applied for Education, Lie – Applied for Minister's position only  
D – Truth – Applied for Deputy Minister's position, Lie – Applied for Minister's position in Finance  
E – Truth – Did not apply for Home, Lie – Applied for Minister's position only  
F – Truth – Applied for Finance, Lie – Applied for Deputy Minister's position
17. Who has applied for the Deputy Minister's position in the Education department?
- (A) A  
(B) B  
(C) C  
(D) D  
(E) E

We must analyse both statements of all 6 MLAs. The choices made by C and F will be clear by analyzing

their statements. Using them we will get the choices made by the others too.

The given information can be tabulated as follows:

Department	Ministers	Deputy Minister
Home	A	D
Finance	F	E
Education	B	C

Therefore, looking at the above table it is clear that C has applied for the Deputy Minister's position in the Education department.

The correct answer is C.

18. Which position will D hold?

- (A) Minister – Home
- (B) Minister – Education
- (C) Deputy Minister – Home
- (D) Deputy Minister – Finance
- (E) Deputy Minister – Education

Looking at the above table it is clear that D is Deputy Minister in the Home department.

The correct answer is C.

19. Who will be the Minister of Finance?

- (A) B
- (B) C
- (C) D
- (D) E
- (E) F

Looking at the above table it is clear that F will be the Minister of Finance.

The correct answer is E.

20. Which position did A apply for?

- (A) Minister – Home
- (B) Minister – Education
- (C) Deputy Minister – Home
- (D) Deputy Minister – Finance
- (E) Deputy Minister – Education

A applied for the position of Minister in the Home department.

The correct answer is A.

Directions for question 21–24: A word-arrangement machine rearranges its input using a particular rule. The following is the illustration of the input and the steps of arrangements. Use the same logic to answer the questions that follow.

Input:	a	boon	to	the	learning	mind
Step 1:	learning	a	boon	to	the	mind
Step 2:	learning	mind	a	boon	to	the
Step 3:	learning	mind	boon	a	to	the
Step 4:	learning	mind	boon	the	a	to
Step 5:	learning	mind	boon	the	to	a

21. Which of the following would be the third step for the following input?

Input: The world cup final was held at Brazil's capital

- (A) capital Brazil's the world cup final was held at
- (B) capital Brazil's world final held the cup was at
- (C) capital Brazil's world final the cup was held at
- (D) capital Brazil's world the cup final was held at
- (E) capital the world cup final was held at Brazil's

The logic for arranging is that the word with the largest number of letters should come first and so on. If two words have the same number of letters, the word with the 1st letter of a higher position in the alphabetical order will come first.

The given input can be rearranged as follows:

Input	the	world	cup	final	was	held	at	brazil's	capital
Step 1	capital	The	world	cup	Final	was	held	at	Brazil's
Step 2	capital	Brazil's	the	world	Cup	final	was	held	At
Step 3	capital	Brazil's	world	the	Cup	final	was	held	at

The correct answer is D.

22. How many steps will be required to get the final output from the following input?

Input: Kolkata is called the city of palaces

- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 6



The given input can be rearranged as follows:

Input	Kolkata	is	called	the	city	of	palaces
Step 1	palaces	Kolkata	is	called	the	city	of
Step 2	palaces	Kolkata	called	is	the	city	of
Step 3	palaces	Kolkata	called	city	is	the	of
Step 4	palaces	Kolkata	called	city	the	is	of

The correct answer is D.

23. If the following is the second step of an input, what will be the third word from the left in Step 4?

Step 2: school late you are for the

- (A) are  
(B) for  
(C) the  
(D) you  
(E) late

The second step can be rearranged further as follows:

Step 2	school	Late	you	are	for	the
Step 3	school	Late	you	the	are	for
Step 4	school	Late	you	the	for	are

The correct answer is D.

24. If the following is the second step of an input, what will be the fourth step?

Step 2: monsoon gathers arrives rain as pace in July

- (A) monsoon gathers arrives rain pace July as in  
(B) monsoon gathers arrives rain pace as in July  
(C) monsoon gathers arrives rain pace July in as  
(D) monsoon gathers arrives as rain pace in July  
(E) monsoon gathers rain pace as in July arrives

The second step can be rearranged further as follows:

Step 2	monsoon	gathers	arrives	rain	as	pace	in	July
Step 3	monsoon	gathers	arrives	rain	pace	as	in	July
Step 4	monsoon	gathers	arrives	rain	pace	July	as	in

The correct answer is A.

25. Read the information below and answer the question that follows.

Saroj, Raman and Shivam are Mrs and Mr Sharma's children.

Reeta, Rajan and Sumit are Mrs and Mr Pandey's children.

Sumit is married to Saroj.

Mr Sharma has two sons and one daughter who is Saroj.

Aman and Sanjay are Sumit's sons.

Gauri and Reshabh are Mrs and Mr Kapoor's children.

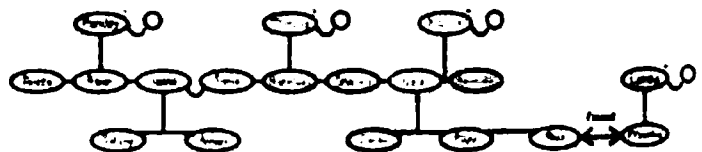
Gauri is married to Shivam and has three children, Riya, Sanju and Rajiv.

Priyanka is Riya's friend, and Mrs and Mr Lamba's daughter.

What is Aman's surname?

- (A) Lamba  
(B) Kapoor  
(C) Pandey  
(D) Sharma  
(E) Cannot be determined

Using the given information, the family diagram can be drawn as:



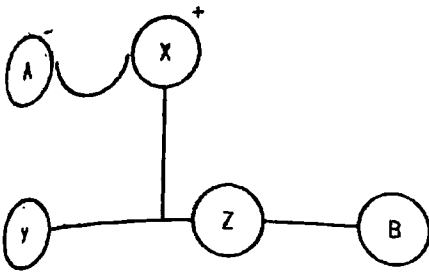
As Aman belongs to Mrs and Mr Pandey's family, his surname will be Pandey.

The correct answer is C.

26. If X is the father of Y and Z, while Z is also B's brother and A is Y's mother, then, which of the following cannot necessarily be true?

- (A) A is the mother of B.  
(B) B is the brother of Z.  
(C) X is the father of B.  
(D) Z is the brother of Y.  
(E) Z is the son of A.

Using the given information, the family diagram can be drawn as:



As the gender of B is not known, B is not necessarily the brother of Z.

The correct answer is B.

27. We are bombarded with misguided advertisements that give advice on healthy eating, and this has had the effect of making food seem hugely complicated. People are demoralised because they are trying to follow this advice, yet they are getting fatter and fatter. For lots of people, food has become a minefield of do's and don'ts and a relaxed appreciation of the pleasures of eating has got a bit lost along the way. In fact, eating well is simple when you apply a few fundamental principles.

What can be concluded from the above?

- (A) Advertisements have continuously misguided the general public about healthy eating.
- (B) In our pursuit of healthy eating, we have forgotten the small pleasures of eating.
- (C) The do's and don'ts of healthy eating have become an integral part of our lives.
- (D) Eating becomes healthy only if we apply some basic rules to it.
- (E) Healthy eating has been simplified by the government.

The use of 'continuously' in option A and 'only' in option D makes these two incorrect, as they are extreme in their analysis. Option E is beyond the scope of the arguments made in the passage while option C contradicts the information given in the passage. This makes option B correct.

The correct answer is B.

28. Ramesh whose results were yet to be announced, was seeking information about the college's admission procedure. The college is known to admit only those students who score above 95% in PCM.

What can be inferred from the above statements?

- (A) Ramesh had scored above 95% in PCM.

- (B) Ramesh was confident of scoring above 95% in PCM.
- (C) Like all kids, Ramesh was coming under parental pressure to apply to all colleges.
- (D) The college had announced a possible increase in the cut-off score for admissions into their science stream that year.
- (E) The college had announced a possible reduction in the cut-off score for admissions into their science stream that year.

The only inference that can be drawn from the information provided is that Ramesh was confident of scoring above 95% in PCM, which is why he made inquiries about the college's admission process. (The college is known to admit only those students who score above 95% in PCM. So, we may assume that Ramesh too knows it and is still seeking information about the college.) All the other options are beyond the scope of the passage.

The correct answer is B.

29. A group of researchers in Boston, Massachusetts have developed a dietary supplement that triggers the body to increase the levels of free testosterone naturally and safely.

Which of the following can be most inferred from the statement above?

- (A) Testosterone in the body can only be increased through dietary supplements.
- (B) Testosterone in the body could not be increased before this epochal research result.
- (C) Testosterone when provided as a dietary supplement, does not attach itself with anything and is found to be free.
- (D) Increasing testosterone in the body used to be possible before this research attempt too, however, it was perhaps unsafe and artificially induced.
- (E) There are two types of testosterone in the body—bonded that attach to molecules and are mostly ineffective and free testosterone that can easily enter cells and increases strength and stamina.

Options C and E are beyond the scope of the passage; the types of testosterone and its nature have not been mentioned anywhere in the information. Options A and B are extreme in their analysis. This makes option D correct.

The correct answer is D.

30. The study showed that criminals from the lower socio-economic strata also had limited access to schooling.

The argument above seems to be:

- (A) an inference
- (B) a conclusion
- (C) an assumption
- (D) an argument-weakening statement
- (E) an argument-strengthening statement

The statement is clearly a conclusion being drawn by the writer based on information/data available in a study.

**The correct answer is B.**

31. Ram always spoke about the new joiner as a serious and non-partying type of a person.

Which of the following statements will weaken the above argument?

- (A) At the annual meeting of the company, the new joiner was seen sitting quietly in one corner.
- (B) At the annual meeting of the company, the new joiner was seen making polite conversations with people.
- (C) At the annual meeting of the company, the new joiner sat and watched everyone dancing and merry making.
- (D) At the annual meeting of the company, the new joiner was seen losing his cool and walking off from the scene of the party in a huff.
- (E) At the annual meeting of the company, the new joiner had let his hair down and seemed to be getting along with people like a house on fire.

If a person is described as 'serious and non-partying types', then he is expected to be quiet, reserved and polite in a large gathering. However, if he 'lets his hair down', that is, enjoys himself and interacts with people, it is in direct contrast with the personality traits attributed to him. Options A, B and C are strengthening the above argument. D is not related to the above argument (as serious and non-partying doesn't mean that the person can't be angry.)

**The correct answer is E.**

32. Anita: I sold my house through a real estate agent last year and was happy with the price that I received. My house was sold quickly and I did not have to suffer any advertising hassles. I would advise against selling your house through Internet websites, newspapers or magazine listings.

Bablu: It is in the interest of the Internet websites, newspapers and magazines to get me the best price for my property because they are a relatively new medium wanting to establish themselves. Besides, their fee is dependent on the selling price. Therefore, while selling my house I will certainly use Internet websites, newspapers or magazine listings rather than trying to sell the house through a real estate agent.

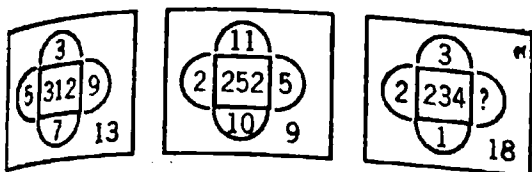
All of the following statements are strengthening Bablu's argument. Which one is the EXCEPTION?

- (A) Both mediums are different so it is unfair to compare them.
- (B) Houses often obtain a lower price when sold through a real estate agent.
- (C) Some customers pay these Internet websites, newspapers and magazines to find them a less-expensive house.
- (D) The Internet website, newspaper and magazine services include many add-on benefits in terms of legal advice, market report and advice that a real estate agent usually hides.
- (E) The fee that the Internet websites, newspapers and magazines charge is usually less than the difference between the amount that a real estate agent would charge and the amount that the Internet websites, newspapers and magazines would charge.

The main point of contention between Anita's and Bablu's arguments is the price obtained for properties sold through the two mediums—real estate agents and online mediums. While Anita believes that houses sold through real estate agents fetch a good price, Bablu believes that sales made through Internet websites, newspapers and magazines get the best price. The reason he gives for the same is that these mediums are relatively new and they want to establish themselves. Besides, their fee is also dependent on the selling price. All the arguments given strengthen Bablu's claim except option C. If there are people who pay these websites to find them a less expensive house, then it is plausible that these websites will actually try to sell the houses at a lower price, as it would result in greater benefit for them.

**The correct answer is C.**

33. In the figure below, which number can substitute the question mark?



- (A) 9  
(B) 7  
(C) 5  
(D) 3  
(E) 0

The pattern followed is:

$$(5 + 3 + 9 + 7) \times 13 = 312$$

$$(2 + 11 + 5 + 10) \times 9 = 252$$

Similarly,

$$(2 + 3 + x + 1) \times 18 = 234$$

$$\Rightarrow x = 7$$

The correct answer is B.

34. What should be in place of the question mark in the figure?

3	2	5	10
4	11	7	?
73	129	368	1144

- (A) 3  
(B) 4  
(C) 6  
(D) 8  
(E) 12

The pattern followed is:

$$3^2 + 4^3 = 9 + 64 = 73$$

$$2^3 + 11^2 = 8 + 121 = 129$$

$$5^2 + 7^3 = 25 + 343 = 368$$

Similarly,

$$10^3 + 12^2 = 1000 + 144 = 1144$$

The correct answer is E.

35. What is next in the series?

1, 2, 9, 64, 625, ?

- (A) 746  
(B) 960  
(C) 2960  
(D) 5966  
(E) 7776

The pattern followed is:

$$1^0 = 1$$

$$2^1 = 2$$

$$3^2 = 9$$

$$4^3 = 64$$

$$5^4 = 625$$

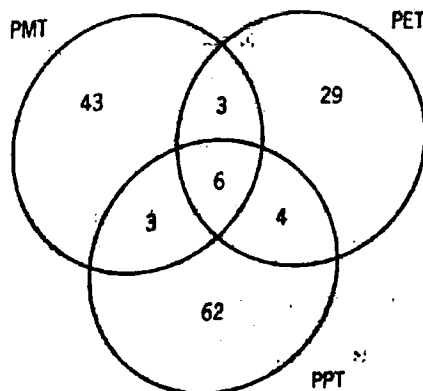
$$6^5 = 7776$$

The correct answer is E.

36. Out of a total of 150 students in a school, 43 students passed only Pre Medical Test (PMT), 29 passed only Pre Engineering Test (PET), and 62 passed only Pre Pharmacy Test (PPT). Six students passed all the three tests. 4 students did not pass the PMT but passed the other two tests. PPT was passed by 50% of the students. A total of 55 students passed PMT. How many students passed both PMT and PET?

- (A) 3  
(B) 4  
(C) 5  
(D) 6  
(E) 10

The given information can be represented in Venn diagram as follows:



Therefore, 3 students passed both PMT and PET.

**The correct answer is option A.**

37. Of 1560 girls, 230 did not play tennis or badminton, 50 did not play hockey or tennis and 40 girls did not play badminton or hockey. 525 played both tennis and badminton, 545 played both hockey and tennis and 510 played both hockey and badminton. How many girls played all three sports?

- (A) 45  
(B) 170  
(C) 300  
(D) 400  
(E) 1005

Given that 40 girls did not play badminton or hockey, they must have been playing tennis.

Hence,  $n(\text{Tennis}) = 40$ ,

Similarly, we get  $n(\text{Hockey}) = 230$  and  $n(\text{Badminton}) = 50$

Now, the total number of girls who play more than one game  $= 1560 - (40 + 230 + 50) = 1240$

Now, the number of girls playing all the three sports is given by

$$2\{n(\text{Tennis}) \cap n(\text{Hockey}) \cap n(\text{Badminton})\} \\ = (525 + 545 + 510) - 1240 = 340$$

$$\Rightarrow n(\text{Tennis}) \cap n(\text{Hockey}) \cap n(\text{Badminton})$$

$$= \frac{340}{2} = 170$$

**The correct answer is B.**

38. Many small-scale sector units in India become unviable and close down resulting in a huge loss to both the entrepreneur and the government.

What decision should the government take in this situation?

- (A) The banks should be asked to provide cheaper loans to the small-scale sector units.  
(B) The government should appoint a technical committee to find out the reasons for the units' closure.  
(C) The entrepreneurs should be encouraged to restart their ventures as one should not give up after a failure.  
(D) The government should give contracts only to multinationals to develop the small-scale sector units in India.

- (E) The government should discourage the small-scale sector units in India as it eventually results in losses and failed entrepreneurship.

It is stated that the small-scale sector units close down because they become unviable. Hence, the logical course of action that should be followed by the government is to set up a committee to analyse the reasons behind this. Providing cheaper loans or restarting these ventures will not be helpful as long as the real concerns are not addressed. Option E is extreme in its suggestion. Option D gives an extreme suggestion and we don't know how multinationals can help to develop the small-scale sector units in India.

**The correct answer is B.**

39. Which of the following could be correct if for a certain equation,  $AAAC + B4 = AAC0$ ?

- (A)  $A = \frac{B}{2}$   
(B)  $A = \frac{C}{2}$   
(C)  $B = \frac{A}{2}$   
(D)  $C = \frac{B}{2}$   
(E)  $C = \frac{A}{2}$

$$AAAC + B4 = AAC0$$

So,  $C + 4$  must be 0 or 10 or 20 etc., (that is 0 or a number having 0 at unit's place with some carry over).

The only possibility is  $C + 4 = 10$

So,  $C$  must be 6.

For, ten's digit we have  $1(\text{carry over}) + A + B = 6$  (as  $C = 6$ )

So,  $A + B = 5$  and  $A$  cannot be 0

Possible values for  $A, B = (1,5); (2,3); (3,2); (4,1)$  and  $(5,0)$

We know the value of  $C = 6$  and looking at options with 5 possible values of  $(A,B)$

The only possibility is Option B with  $A = 3, B = 2$  and  $C = 6$

**The correct answer is B.**

40. Find  $A + B$  if  $\left(\frac{AAA + B}{A}\right) \times 9 = 10AB$

- (A) 4
- (B) 6
- (C) 7
- (D) 8
- (E) 9

$$\left(\frac{AAA + B}{A}\right) \times 9 = 10AB$$

$$\left(111 + \frac{B}{A}\right) \times 9 = 10AB$$

$$\frac{9B}{A} = AB + 1$$

$$\text{Now, } AB = 10A + B$$

$$\text{So, } \frac{9B}{A} = 10A + B + 1$$

$$\text{So, } B = A \left( \frac{10A + 1}{9 - A} \right)$$

As  $B$  must be an integer, we can check for possible values of  $A$ . If  $A = 2$  Then  $B = 6$ .

$$\text{So, } A + B = 8$$

The correct answer is D.

WTJAMQ

## 8.2 Past NMAT by GMAC™ Test Paper—2

# Language Skills

1. **Directions:** In the given question, the sentence has four underlined words or phrases. Identify the one underlined word or phrase that must be changed in order to make the sentence correct. Mark E for no error.

I wonder if you can give me an information about a certain Mr. Roy who used to live here.

- (A) if
- (B) an
- (C) a
- (D) to
- (E) No error

## Passage for Questions 2–5

Cancer, a word that elicits dread in nearly everyone, continues to puzzle scientists. Despite attempts made by science to decipher this terrible disease, scientists still struggle to find an answer to questions such as, 'why does cancer strike some and not others?', 'Are its 'seeds' part of our genetic makeup?'

Different terms are used when discussing cancer. Neoplasm is an abnormal cell mass that develops when the controls of the cell cycle and cell division malfunction. However, all neoplasms are not cancerous. Benign neoplasms do not spread, and are always seen to be local affairs. They are usually surrounded by a capsule and grow slowly, seldom doing their hosts if they are removed before they affect vital organs. Malignant neoplasms, on the other hand, are not encapsulated, grow more relentlessly and can even kill. They resemble immature cells and invade their surroundings rather than push them aside. Malignant cells are also capable of metastasis—that is, they tend to spread via blood to distant parts of the body and form new masses.

But what causes the transformation? In other words, what converts a normal cell to a cancerous one? It is well known that cancer-causing elements or carcinogens can be found in radiation, mechanical trauma, certain viral infections and many chemicals (tobacco tars, saccharine). All of these have one common factor—all of them cause mutations, which are changes in DNA that alter the expressions of certain genes. Usually carcinogens are eliminated by the immune system or certain enzymes. It must also be stated here that it takes much more than just one mutation to change a normal cell into a full-fledged cancer cell.

It was with the discovery of oncogenes (cancer causing genes) followed by proto-oncogenes that the role of genes started to gain prominence. Although proto-oncogenes code

for proteins that are needed for normal cell division and growth, many of them have fragile areas that break when exposed to carcinogens, converting them to oncogenes. As a result, problems such as, 'switching on' of dormant genes that allows cells to become invasive, arise. Oncogenes have been discovered in only 15 to 20 percent of human cancers. Therefore, it came as no surprise when the tumour suppressor genes were discovered recently – these, as their names suggest, suppress or prevent cancer. The tumour suppressor genes not only put the 'brakes' on cell division but they help with DNA repair and help to deactivate carcinogens, thereby enhancing the immune system's ability to destroy cancer cells. It is when the tumour suppressor genes are damaged or changed in some way, that the oncogenes are free to 'do their thing'. Whatever the precise genetic factor at work, the seeds of cancer do appear to be in our own genes. Cancer is indeed intimate!

2. What is the central idea of the passage?
  - (A) evolution of cancer
  - (B) role of genes in cancer
  - (C) early warning signs of cancer
  - (D) procedures for detecting cancer
  - (E) how an abnormal cell mass can cause cancer
3. According to the passage, cancer is an 'intimate enemy' because:
  - (A) of the kind of treatment available for cancer.
  - (B) most of us know someone who has had cancer.
  - (C) it is closely related to the body's immune system.
  - (D) it brings people affected by cancer closer together.
  - (E) the 'seeds' of cancer appear to be in our own genes.
4. According to the author, what can be concluded from the passage?
  - (A) Occurrence of cancer depends on our genetic make-up.
  - (B) Abnormal masses in the body are the sole reason for cancer.
  - (C) Cancer has now become a very common disease and can be treated easily.
  - (D) There are several factors that cause cancer and genes play a significant role.



- (E) Though cancer is a dreadful disease, there are several promising new treatments.
5. According to the passage, the author most likely agrees with all of the following statements EXCEPT:
- (A) Surgical removal is a treatment for neoplasm.
  - (B) It takes only one genetic mutation to make a normal cell cancerous.
  - (C) Most carcinogens are eliminated by enzymes or the immune system.
  - (D) Carcinogens cause changes in DNA that alter the expression of genes.
  - (E) Chemicals such as tobacco tar and saccharine can act as carcinogens.
6. Select the word that is nearly the opposite in meaning to the given word: *parsimonious*
- (A) greedy
  - (B) Parisian
  - (C) penurious
  - (D) tight-fisted
  - (E) philanthropic
7. Select the word that is nearest in meaning to the given word: *prescribe*
- (A) bundle
  - (B) betray
  - (C) deceive
  - (D) stipulate
  - (E) admonish
8. **Directions:** Rearrange the jumbled sentences to show the appropriate sequence.
- (A) While a luxury one usually starts with fish—pickled herring, smoked eel or hot fried plaice.
  - (B) Danish food includes a variety of open sandwiches.
  - (C) The sandwiches are traditionally served for the mid-day meal.
  - (D) An ordinary mid-day meal consists of just a simple sandwich prepared during breakfast and packed in a lunch box.
  - (E) The cuisine of Denmark stems from the country's agricultural past, as well as its geography and climate.
- (A) EDBCA
  - (B) ABCDE
  - (C) EBCDA
  - (D) DECAB
  - (E) BEDAC

9. **Directions:** Rearrange the jumbled sentences to show the appropriate sequence.
- (A) Most of these places are high up on mountains.
  - (B) This hardened ice is what comprises the glacier.
  - (C) Repeated snowfalls compress the lower layers of snow.
  - (D) Glaciers form in extremely cold places.
  - (E) Finally, the lowest layer hardens and turns into ice.
- (A) ABEDC
  - (B) DCEBA
  - (C) CADEB
  - (D) CBDAE
  - (E) DACEB
10. **Directions:** Rearrange the jumbled sentences to show the appropriate sequence.
- (A) The hedgehog population in the UK has drastically fallen from 30 million in the 1950s to about 1.5 million in 2011, and Britons may not see any more red squirrels in 20 years' time, according to a report.
  - (B) In general, according to the report, the situation has improved for species restricted to habitats that could benefit from site-based conservation and has worsened for many widespread species such as hedgehogs and red squirrels.
  - (C) However, the future of otters, bats and water voles is not as bleak as their populations have increased, thanks to improving conservation efforts.
  - (D) The report 'State of Britain's Mammals 2011' by Oxford University's wildlife conservation unit also shows that the dwindling population of the common dormouse and mountain hare is threatened.
  - (E) A ban on chemicals used in sheep dip in the late 1990s, for instance, has resulted in cleaner rivers in Britain, which in turn, has benefitted otters.
- (A) ADBCE
  - (B) ADCEB
  - (C) ABCED
  - (D) ABDCE
  - (E) DABCE

**Directions for Questions 11–12:** In the given question the sentence has four underlined words or phrases. Identify the one underlined word or phrase that must be changed in order for the sentence to be correct. Mark (E) for no error.

11. Only about a hundred out of an estimating 3,000 known mineral species have been found at least reasonably suitable for use as gems.

(A) estimating  
(B) been found  
(C) reasonably  
(D) for use  
(E) No error

12. Shivering from the cold and trembling with fatigue, the old man begged permission to lay down awhile before moving on.

(A) with fatigue  
(B) begged permission  
(C) lay down  
(D) awhile  
(E) No error

Directions for Questions 13–14: Choose the set of prepositions whose meaning and sequence best fits the 3 given sentences.

13. 1. A problem exists when we become aware of the difference \_\_\_\_\_ the reality and our desires.  
2. Individuals differ \_\_\_\_\_ one another in their ability to understand complex ideas.  
3. IQ tests were mainly designed \_\_\_\_\_ identifying mentally challenged children.

(A) for  
(B) from  
(C) besides  
(D) through  
(E) towards  
(F) between  
(A) CEB  
(B) AFD  
(C) FBA  
(D) DAC  
(E) FAC

14. 1. Good management comprises an array \_\_\_\_\_ practices and experience.

2. You must focus \_\_\_\_\_ your objectives.

3. This is a serious matter and should not be pushed \_\_\_\_\_ the carpet.

(A) at  
(B) of  
(C) in

(D) on  
(E) under  
(F) although  
(A) ADB  
(B) ABD  
(C) BDE  
(D) CDE  
(E) ACB

Directions for Questions 15–16: Choose the word or set of words for each blank that best fits the meaning of the sentence as a whole.

15. We need to \_\_\_\_\_ in a few stops to stretch our legs when we determine how long it will take to drive to Aunt Suzy's house.

(A) issue  
(B) factor  
(C) manage  
(D) acquire  
(E) intimidate

16. The robber \_\_\_\_\_ the location of the stolen money after being questioned for several hours.

(A) emerged  
(B) expected  
(C) concealed  
(D) disclosed  
(E) threatened

17. Select the word or phrase that is nearly the opposite in meaning to the given word: *irascible*

(A) outgoing  
(B) agreeable  
(C) friendly  
(D) benign  
(E) patient

18. Select the word or phrase that is nearest in meaning to the given word: *affront*

(A) abstruse  
(B) examine  
(C) forbear  
(D) scorn  
(E) yield

19. Directions: In the given question, the sentence has four underlined words or phrases. Identify the one underlined word or phrase that must be changed in

order to make the sentence correct. Mark E for no error.

Retiring C.E.O. Hira Byebye asked his managers to take interest in the management after his retirement.

- (A) Retiring C.E.O.
- (B) asked his
- (C) interest
- (D) after his retirement.
- (E) No error

20. **Directions:** Choose the word or pair of words that best completes the relationship to the given pair.

pre-empt : anticipation :: \_\_\_\_\_ : \_\_\_\_\_

- (A) plan : debriefing
- (B) recruit : position
- (C) study : opportunity
- (D) inoculate : vaccination
- (E) quarantine : prognosis

21. Select the word or phrase that is nearly the opposite in meaning to the given word: *sibylline*

- (A) unprophetic
- (B) perceptive
- (C) eloquent
- (D) palpable
- (E) overt

22. **Directions:** Rearrange the jumbled sentences to show the appropriate sequence.

- (A) In fact, experts advise a comprehensive recruitment policy so as to avoid bad hires.
  - (B) The recruitment process of any company begins when the need for human resources is determined.
  - (C) They then end up hiring rather than recruiting.
  - (D) This in turn leads to bad recruitment.
- (A) ABCD
  - (B) ACBD
  - (C) ADBC
  - (D) BADC
  - (E) BCDA

**Directions for Questions 23–24:** Choose the set of prepositions whose meaning and sequence best fits the 3 given sentences.

23. 1. The manager's eye lingered \_\_\_\_\_ the new recruit.  
2. He was looking \_\_\_\_\_ Tom for instructions.  
3. She shivered \_\_\_\_\_ fear.

- (A) on
  - (B) under
  - (C) to
  - (D) at
  - (E) in
  - (F) by
- (A) ACE
  - (B) AEC
  - (C) CBA
  - (D) DAE
  - (E) FED

24. 1. Rituparno is waiting for his friend \_\_\_\_\_ the hospital.  
2. Rituparno is \_\_\_\_\_ the hospital.  
3. He is mad \_\_\_\_\_ cleanliness and hygiene.
- (A) in
  - (B) on
  - (C) at
  - (D) into
  - (E) about
  - (F) over
- (A) ABF
  - (B) ACF
  - (C) ADB
  - (D) CDE
  - (E) CAE

### Passage for Questions 25–28

According to Wimsatt and Beardsley, even though the influence of the author's 'intention' upon the critic's opinion has been disputed in a number of discussions, it is doubtful whether most of its 'romantic corollaries' are widely subject to questioning. The author duo finds the design or intention of the author neither accessible nor desirable as a yardstick for judging the accomplishment of a literary text. They define 'intention' as "design or plan in the author's mind. Intention has obvious affinities for the author's attitude toward his work, the way he felt, what made him write."

Even though a text comes into existence only through the medium of an author, it is erroneous to assign the author's design to the status of a standard by which critics are to evaluate the text. Besides, the question arises as to how a critic is to find out the 'intention' behind a text. Wimsatt and Beardsley believe that if the poet was successful in bringing out his intention through the words he had written, it must be evident in the poem itself. And if the poet was not successful in doing so, the critic must move outside the text to search for the intention. Unlike practical messages, which are

successful only if the readers correctly infer the intention of the author, poems should just be, not mean.

Another argument that the duo puts forward is regarding the process of revision. Authors often revise their work, thereby creating multiple versions of the same text. This raises the question of which intention is to be considered by the critics. By extension, it raises the question of whether the author's former concrete intention was not his intention".

Wimsatt and Beardsley conclude that a text is neither the critic's nor the author's. It is detached from the author at birth and goes about the world beyond his power of intention or ability to control it. The poem belongs to the public. It comes to life through language, which is the peculiar possession of the public and it is about the human being, which is an object of public knowledge.

25. The passage is primarily concerned with:

- (A) an evaluator's paradigm for evaluation.
- (B) the worth of the objective at the source.
- (C) public knowledge regarding a literary text.
- (D) the significance of Wimsatt and Beardsley's ideas.
- (E) the question regarding the revision of literary texts.

26. The author mentions all of the following EXCEPT:

- (A) the work of the author belongs to the public.
- (B) language gives life to a piece of literary work.
- (C) critics consign meaning to books and poems.
- (D) no one has ever questioned the intention of the poet.
- (E) practical passages require an understanding of the author's intention.

27. According to the passage, the author most likely agrees with all of the following statements EXCEPT:

- (A) the intention of the author is redundant.
- (B) a text is never for the author to call his own.
- (C) the author's intention must always be preserved.
- (D) the author's attitude towards his work is set in stone.
- (E) authors often revise their work creating multiple versions of the text.

28. What is meant by the statement that "The poem belongs to the public"?

- (A) The author writes only for the public.
- (B) Critics can never influence the public's ideas.

- (C) The public assigns meaning to a work of literature.
- (D) Literature can be possessed only by the public.
- (E) Authors and critics are outside the public domain.

**Directions for Questions 29–32:** The following passage has blanks that have been numbered (1) to (4). From the given words, fill in the blanks with the most appropriate words.

(1) \_\_\_\_\_, these modern tools of communication can also be tools of (2) \_\_\_\_\_, making us feel so out of touch, so much more in need of real human contact. If a computer message came addressed as simply "Hi", I'd feel forgotten and (3) \_\_\_\_\_. If however, a more personalised message or call were to come, it would (4) \_\_\_\_\_ my day and make me feel like I was part of their family unit after all.

29. (1)

- (A) Ironically
- (B) Naturally
- (C) Fastidiously
- (D) Suspiciously
- (E) Contemptuously

30. (2)

- (A) elevation
- (B) alienation
- (C) allegation
- (D) alleviation
- (E) mollification

31. (3)

- (A) discernible
- (B) neglected
- (C) negligent
- (D) forgiven
- (E) omitted

32. (4)

- (A) enlighten
- (B) brighten
- (C) lighten
- (D) signify
- (E) burden

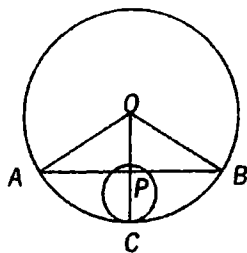
# Quantitative Skills

1. **Directions:** A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

What is the selling price of the mixture if the ratio of the two qualities of tea mixed is 3:4?

- (1) Cost price of the first quality of tea is Rs 180 per kg.
- (2) Cost price of the second quality of tea is Rs 225 per kg.
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

2. In the given figure,  $O$  is centre of the larger circle of radius 10 cm while  $P$  is the centre of the smaller circle. If  $AB = 10\sqrt{2}$  cm, find the area of segment  $ABC$  lying outside the smaller circle.



- (A)  $22.5\pi - 25$
  - (B)  $22.5\pi - 50$
  - (C)  $45\pi - 25$
  - (D)  $45\pi - 50$
  - (E)  $45\pi - 100$
3. Find the smallest 4-digit number which, when increased by 8, is divisible by 12, 18, 30 and 45.
- (A) 1,072
  - (B) 1,080
  - (C) 1,088

- (D) 1,096
- (E) 1,120

4. Fahim and Farhan together earned Rs 37,570 from a business venture. They divided it and each deposited his share in a bank. At the end of 9 years the amount Farhan had in the bank was the same as the amount Fahim had at the end of 7 years. If the interest was compounded annually at 10% per annum, what was Farhan's share of the money earned from the business venture?

- (A) Rs 14,174
- (B) Rs 16,437
- (C) Rs 17,000
- (D) Rs 18,785
- (E) Rs 20,570

5. A tank can be filled by Pipe 1 in 7 hours and by Pipe 2 in 5 hours. There is a waste pipe which is kept open when Pipe 2 is working; the tank then takes 8 hours 30 minutes to fill. What is the approximate time taken to fill the tank if all the three pipes are working?

- (A) 3 hours 20 minutes
- (B) 3 hours 50 minutes
- (C) 4 hours 15 minutes
- (D) 4 hours 50 minutes
- (E) 5 hours 30 minutes

6. In a shop, there are 500 sweet products. 210 are biscuit-based, 160 are milk-based and 160 are coconut-based. 80 have both milk and coconut but no biscuit, 70 have milk and biscuit but no coconut, 60 have biscuit and coconut but no milk. How many items have all three ingredients if 200 have none of these ingredients?

- (A) 10
- (B) 30
- (C) 50
- (D) 130
- (E) Cannot be determined

7. If the roots of the equation  $ax^2 + bx + c = 0$  are reciprocal of the roots of the equation  $px^2 + qx + r = 0$ ,

then which of the following represents relation(s) between  $a, b, c, p, q$  and  $r$ ?

- (A)  $a = \frac{1}{p}$   
 (B)  $b = \frac{1}{q}$   
 (C)  $c = \frac{1}{r}$   
 (D)  $a = p, c = r$  and  $b = 1$   
 (E)  $a = r, c = p$  and  $b = q$

1. Which of the following represents  $\frac{(2n)!}{n!}$ ?

- (A)  $1 \cdot 3 \cdot 5 \cdots (2n-1)(2n)$   
 (B)  $1 \cdot 3 \cdot 5 \cdots (2n+1)(n!)$   
 (C)  $1 \cdot 3 \cdot 5 \cdots (2n+1)(2n)$   
 (D)  $1 \cdot 3 \cdot 5 \cdots (2n+1)(2n)(n!)$   
 (E)  $1 \cdot 3 \cdot 5 \cdots (2n-1)(24)(n!)$

2.  $(4\sqrt{3}-3)$  and  $(-4, -3)$  are vertices of an equilateral triangle. Which of the following could be the coordinates of the third vertex?

- (A)  $(-4, 3)$   
 (B)  $(-4, -4\sqrt{3})$   
 (C)  $(4, 3)$   
 (D)  $(4, -3)$   
 (E)  $(4, 4\sqrt{3})$

3. When 5, 8 and 12 divide a multiple of 13, they leave remainders of 3, 6 and 10, respectively. What is the least such number?

- (A) 169  
 (B) 478  
 (C) 598  
 (D) 1,298  
 (E) 1,602

4. The production of rice increased by 75% from 1990 to 1995. From 1995 to 2000, there was a 100% increase. What is the percentage increase in the production of rice from 1990 to 2000?

- (A) 250%  
 (B) 280%  
 (C) 285%  
 (D) 290%  
 (E) 295%

12. What is the area of a regular hexagon whose perimeter is 12 inches?

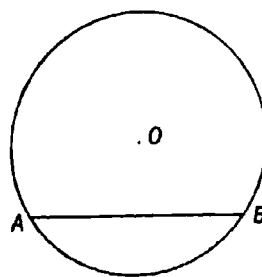
- (A)  $216\sqrt{3} \text{ in}^2$   
 (B)  $36\sqrt{3} \text{ in}^2$   
 (C)  $12\sqrt{3} \text{ in}^2$   
 (D)  $6\sqrt{3} \text{ in}^2$   
 (E)  $4\sqrt{3} \text{ in}^2$

13. If  $(XY)^2 = PQX$ , where each letter represents a distinct digit, then find  $P + Q$ .

- (A) 5  
 (B) 6  
 (C) 7  
 (D) 8  
 (E) 9

14. Directions: This problem consists of a question and two statements, labelled (1) and (2), in which certain data are given. You have to decide whether the data given in the statements are sufficient for answering the question. Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem:

The radius of circle  $O$  below is 8 cm. What is the area of the minor segment?



- (1) The chord  $AB$  subtends an angle greater than  $90^\circ$  at the centre.  
 (2)  $AB = 8\sqrt{3} \text{ cm}$   
 (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
 (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
 (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
 (D) EACH statement ALONE is sufficient.  
 (E) Statements (1) and (2) TOGETHER are NOT sufficient.

15. The average monthly income of Anil and Hemant is Rs 4,025. The average monthly income of Hemant

and Chandan is Rs 6,250. The average monthly income of Anil and Chandan is Rs 9,200. What is Harman's monthly income?

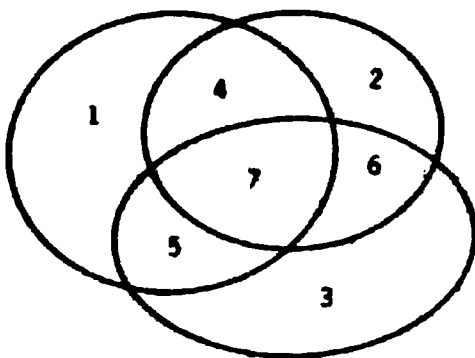
- (A) Rs 4,500
- (B) Rs 5,075
- (C) Rs 5,950
- (D) Rs 6,075
- (E) Rs 6,950

16. Which of the following is a perfect square?

- (A) 97,474
- (B) 1,23,301
- (C) 1,37,641
- (D) 1,70,567
- (E) 1,77,243

17. In a locality of 40 houses, each house is subscribed to at least one newspaper from amongst, The Sun, Daily Mail and Daily Mirror. 24 houses subscribe to Daily Mirror. 13 houses subscribe to both The Sun and Daily Mirror. 26 houses subscribe to Daily Mail out of which 16 also subscribe to The Sun. There is no house which subscribes to The Sun alone. 7 houses subscribe to all three newspapers. How many houses subscribe to only two newspapers?

- (A) 12
- (B) 14
- (C) 16
- (D) 18
- (E) 20



18. Four clocks were set right at the same time. One clock gains 'a' minutes in a day, second clock loses 'b' minutes in a day, third clock gains 'c' minutes in a day and the fourth clock gains 'd' minutes. After how much time will all the clocks again show the correct time simultaneously if  $a + b + c + d = 1$  hour,  $a : b = c : d = 2 : 1$  and  $b : d = 3 : 1$ ?

- (A) 3 hours
- (B) 12 hours

- (C) 24 hours
- (D) 24 days
- (E) 144 days

Directions for Questions 19–22: Go through the given table and solve the question based on it.

	Production of Major Crops (tonnes)				
	Y1	Y2	Y3	Y4	Y5
Foodgrain (Kharif)	69	78	90	102	111
Foodgrain (Total)	106	130	176	197	217
Cereals (Kharif)	65	74	94	98	106
Cereals (Total)	97	119	162	186	202
Pulses (Kharif)	4	4	5	4	5
Pulses (Total)	12	11	14	11	14
Rice (Kharif)	40	50	66	73	80
Rice (Total)	42	54	74	85	93
Oilseeds (Kharif)	7	5	10	12	14
Oilseeds (Total)	10	9	19	18	24

Total foodgrain production = production of rabi foodgrain + production of kharif foodgrain

19. In which year did the production of rabi foodgrains exhibit the highest percentage increase over the preceding year?

- (A) Y1
- (B) Y2
- (C) Y3
- (D) Y4
- (E) Y5

20. From Y2 to Y5, for which crop was the percentage increase in the rabi crop production the highest?

- (A) Rice
- (B) Pulses
- (C) Cereals
- (D) Oilseeds
- (E) Foodgrain

21. What was the average production of rabi cereals from Y1 to Y5?

- (A) 20 tonnes
- (B) 32 tonnes
- (C) 45 tonnes
- (D) 54 tonnes
- (E) 66 tonnes

22. From Y3 to Y4, what was the percentage increase in the total rabi production of the five major crops?

- (A) 21.64%

- (B) 42.45%  
(C) 48.82%  
(D) 52.56%  
(E) 58.34%
23. If  $\log_{10} 2 = 0.3010$ , what is the value of  $\log_5 256$ ?  
(A) 3.11  
(B) 3.26  
(C) 3.44  
(D) 3.67  
(E) 3.82
24. The 5<sup>th</sup> and 9<sup>th</sup> terms of a harmonic progression are  $\frac{2}{3}$  and  $\frac{2}{9}$  respectively. What is the first term of the progression?  
(A) -3.5  
(B) -1.5  
(C) -0.67  
(D) 0  
(E) 1.5
25. Sanya, Babli and Jhanvi started a new business. Sanya's capital was invested for a period which was equal to four times Jhanvi's period of investment whereas Sanya and Babli invested for the same period. Also, twice Sanya's investment is equal to Jhanvi's investment, and Babli's investment is equal to  $\frac{1}{2}$  of Sanya's investment. If the total year-end profit from this business yielded Rs 4,40,000, then what was the total share of Sanya and Babli in this profit?  
(A) Rs 2,40,000  
(B) Rs 2,50,000  
(C) Rs 2,55,000  
(D) Rs 2,60,000  
(E) Rs 3,30,000
26. On January 1, Ajit put Re 1 in his piggy bank. Every day, he put in Rs 2 more than the total amount of money already in the piggy bank. Which of the following expressions gives the total amount of money in Ajit's piggy bank at the end of January?  
(A)  $2^{30}$   
(B)  $2^{31}$   
(C)  $3(2^{30}) - 2$   
(D)  $3(2^{31}) - 2$   
(E)  $3(2^{30})$
27. A person purchased a smartphone for Rs 8,000 and sold it at a profit of 25%. From that amount he

purchased another phone and sold it at a loss of 20%. What is his overall profit or loss?

- (A) profit of Rs 2,000  
(B) profit of Rs 1,000  
(C) loss of Rs 2,000  
(D) loss of Rs 1,000  
(E) neither profit nor loss
28. Harsh alone can complete  $\frac{2}{3}$ <sup>rd</sup> of a coding project in 6 days. Sumit alone can complete  $\frac{1}{3}$ <sup>rd</sup> of the same project in 8 days and Mini can complete  $\frac{3}{4}$ <sup>th</sup> of the same work in 12 days. All of them started coding together. After 4 days, Harsh and Mini left the project. How many more days will be required by Sumit to complete the project?  
(A) 2.33 days  
(B) 2.67 days  
(C) 3.33 days  
(D) 3.67 days  
(E) 4.33 days
29. Using the digits 1, 2, 3 and 4, some two digit numbers can be formed. The sum of these numbers is AA0. AA is:  
(A) 11  
(B) 22  
(C) 33  
(D) 44  
(E) 55

**Directions for Questions 30–33:** Go through the given information and solve the question based on it.

Stock 1, Stock 2 and Stock 3 are stocks of small cap companies and Stock 4 is the stocks of a mid cap company. For each investor, mid cap stocks are given greater weightage than small cap stocks and all the small cap stocks have the same weightage. The weightage is different for each investor.

Investor	Stocks				Total
	Stock 1	Stock 2	Stock 3	Stock 4	
Paul	6,500	7,500	7,000	5,000	36,000
Bindu	7,300		6,700	6,300	
Rohan	6,600	7,300	6,900		
Sheela	4,800			8,900	39,500
Thomas	5,600	3,200	1,200	8,400	

30. Which of the following can be the ratio of the weightage of Stock 4 to the weightage of Stock 2 that Paul holds?



- (A) 1 : 4
- (B) 1 : 3
- (C) 1 : 2
- (D) 3 : 1
- (E) 4 : 1

31. If the ratio of the weightage of small cap stocks to that of mid cap stocks is 1 : N (where N is any integer), what can be the maximum value of Stock 3 that Sheela holds?

- (A) Rs 8,000
- (B) Rs 8,450
- (C) Rs 16,900
- (D) Rs 19,000
- (E) Rs 27,600

32. If the sum of the values of Stock 1 and Stock 3 that Bindu holds is the same as the value of Stock 4 that she holds, what is the ratio of the weightage of her small cap stocks to the weightage of her mid cap stocks?

- (A) 1 : 7
- (B) 2 : 9
- (C) 4 : 15
- (D) 7 : 20
- (E) 9 : 20

33. In Thomas's portfolio, the value of Stock 3 is one-eighth of the value of Stock 4. What is the ratio of the weightage of a small cap stock to the weightage of a mid cap stock that Thomas holds?

- (A) 3 : 4
- (B) 7 : 9
- (C) 7 : 8
- (D) 8 : 9
- (E) 9 : 8

34. How many 5 digit numbers can be formed using the digits 1, 2, 3, 4, 5 and 6 (without repetition) that are divisible by 8?

- (A) 56
- (B) 64
- (C) 72
- (D) 84
- (E) 96

35. **Directions:** This problem consists of a question and two statements, labelled (1) and (2), in which certain data are given. You have to decide whether the data given in the statements are sufficient for answering the question. Using the information provided and

general knowledge, decide whether the information given is sufficient to solve the problem.

If  $a^b$  is such that  $a$  and  $b$  both are integers, then is  $b$  a multiple of 6?

- (1)  $a^b$  is a perfect square.
- (2)  $a^b$  is a perfect cube.
- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

36. What is the minimum value of

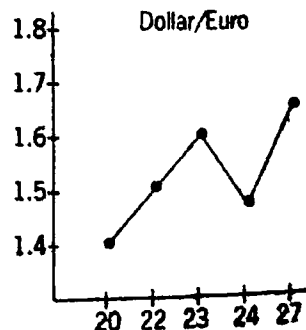
$$\left( x^{2401} + \frac{1}{x^{2401}} + 2 \times x^{2401} \times \frac{1}{x^{2401}} \right)^{1/2}, \text{ where } x > 0?$$

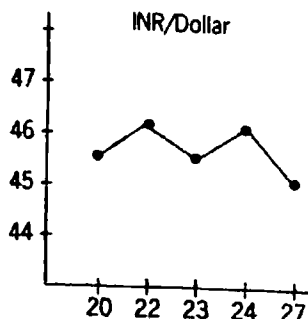
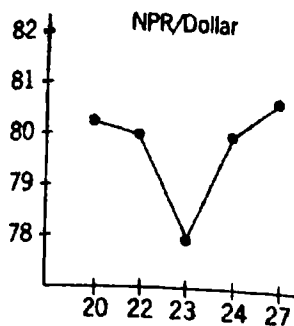
- (A) 2
- (B) 4
- (C) 16
- (D) 49
- (E) It cannot be determined.

37. Find the sum of the interior angles of a nine-sided regular polygon.

- (A)  $20^\circ$
- (B)  $360^\circ$
- (C)  $810^\circ$
- (D)  $1260^\circ$
- (E)  $1620^\circ$

**Directions for Questions 38–41:** Use the graph, which refers to the currency ratio of 20<sup>th</sup> June to 27<sup>th</sup> June 2008, to answer the following questions.





38. On 22<sup>nd</sup> June, how much NPR would be equal to the value of INR 4,000?

(A) 6,596  
(B) 6,956  
(C) 9,656  
(D) 9,665  
(E) None of these

39. If the NPR/Dollar ratio follows the same trend from 27<sup>th</sup> to 30<sup>th</sup> as from 24<sup>th</sup> to 27<sup>th</sup>, what will be the value of 150 Dollars on 30<sup>th</sup> June?

(A) 11,250  
(B) 11,520  
(C) 12,150  
(D) 12,510  
(E) None of these

40. A bike costs \$1,000. Aman has INR 45,500, Euro 600 and 77,000 NPR with him. He would be able to buy the bike on 23<sup>rd</sup> June using (assume that he can use only one type of currency for the transaction):

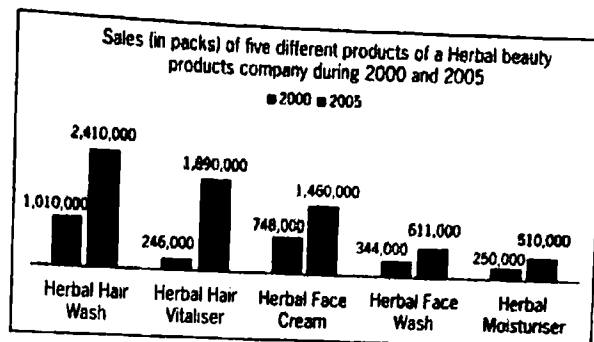
(A) EUR 600  
(B) INR 45,500  
(C) NPR 75,000  
(D) NPR 80,000  
(E) None of the above

41. On 18<sup>th</sup> June, the INR/Dollar ratio was 43.5. On that day INR 6,000 would be equal to:

(A) 4,285 Euro

- (B) 4,582 Euro  
(C) 4,825 Euro  
(D) 5,205 Euro  
(E) Cannot be determined

Directions for Questions 42–45: Go through the given graph and solve the questions based on it. This chart indicates the sales of Herbal Beauty Products Company during a period of time.



42. What is the ratio of percentage growth in sales of Herbal Hair Wash and Herbal Hair Vitaliser during 2000–2005 (rounded off to the nearest integer)?

(A) 1 : 4  
(B) 1 : 5  
(C) 5 : 4  
(D) 4 : 1  
(E) 7 : 8

43. What is the percentage growth in overall sales (in terms of packs) of Herbal Beauty products in 2000 compared to 2005?

(A) 104.3%  
(B) 138.6%  
(C) 164.8%  
(D) 171.3%  
(E) 183.6%

44. For which product did the sales increase by almost 78% from 2000–2005?

(A) Herbal Moisturiser  
(B) Herbal Face Wash  
(C) Herbal Face Cream  
(D) Herbal Hair Wash  
(E) Herbal Hair Vitaliser

45. What is the approximate ratio of the percentage growth in sales of Herbal Hair Vitaliser to the percentage growth of the rest of the products in the period 2000–05?

- (A) 5 : 3
- (B) 5 : 2
- (C) 7 : 2
- (D) 6 : 1
- (E) 9 : 1

**Directions for Questions 46–48:** A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

**46.** What is the area of the quadrilateral?

- (1) The co-ordinates of the vertices are (1, 5), (2, 3), (5, 4) and (4, 7).
- (2) The intersection of its diagonals is at the origin.
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

**47.** A circular park has an iron railing surrounding it. The length of the fence that surrounds circular garden M is  $\frac{1}{3}$  the length of the fence that surrounds circular garden N. What is the area of circular garden N? (Assume that the fence has negligible width.)

- (1) The area of M is  $64\pi$  square meters.
- (2) The diameter of M is  $\frac{1}{3}$  that of N.
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

**48.** The two brothers bought 4 items of antique artefacts to decorate their showroom. However, on persistent requests from customers, both brothers each sold two pieces. Whose transaction resulted in a better profit?

- (1) Ramu sold one item at  $p\%$  profit and the other at  $p\%$  loss though he had bought both items at the same price.
- (2) Somu made  $q\%$  profit on one item and on the other  $q\%$  loss though he sold both items at the same price.
- (A) Statement (1) ALONE is sufficient, but Statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but Statement (1) ALONE is not sufficient.
- (C) BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient, and additional data is needed.

# Logical Reasoning

1. **Directions:** In the given question, there are five choices (A–E). Four of them are alike and one is different. Mark the one that is different.

(A) cat  
(B) horse  
(C) camel  
(D) bullock  
(E) donkey

2. **Directions:** A statement is given followed by two assumptions numbered I and II. An assumption is something supposed or taken for granted. Consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement.

**Statement:**

Mohan requested that his mother arrange food for about 30 persons as he had invited all his friends to celebrate his birthday.

**Assumptions:**

- I. Most of Mohan's friends may come to his house on his birthday.  
II. There may be more than 30 friends who may attend Mohan's birthday party.

(A) Only Assumption I is implicit.  
(B) Only Assumption II is implicit.  
(C) Both I and II are implicit.  
(D) Either I or II is implicit.  
(E) Neither I nor II is implicit.

3. In a certain code language, if CHAIR is coded as DIBJS, how is the word TABLE coded in that same language?

(A) UBCMF  
(B) UBCMG  
(C) UBDMF  
(D) UBCNF  
(E) UBCLF

4. Pointing towards a person, Sita told her son that the person was the only son of his maternal grandmother. Who is that person to Sita's husband?

(A) Father-in-law  
(B) Brother-in-law

(C) Brother  
(D) Father  
(E) Uncle

5. In a certain number system, there are only 5 numerals—0, 1, 2, 3 and 4, which are represented by @, #, \$, £ and ¥, respectively. So, numbers greater than 4 are represented with the help of these numerals only 5 = #@, 6 = ##, 7 = #\$, 8 = #£ and so on.

Which of the following will represent 18?

(A) ¥#  
(B) \$\$  
(C) ##  
(D) ££  
(E) ¥¥

**Directions:** Based on the information given below, answer the question that follows.

During the summer vacation, Manish started 4 classes between 1 pm and 8 pm on five days (Monday to Friday) of the week—Manish learns:

- I. Swimming—all 5 days of the week at the same time slot either from 1 pm to 3 pm or from 6 pm to 8 pm.  
II. Music—either on Tuesday, Wednesday and Friday from 2 pm to 4 pm or on Monday and Thursday from 4 pm to 7 pm.  
III. Cricket—either on Monday and Thursday from 3 pm to 5 pm or on Tuesday, Wednesday and Friday from 4.30 pm to 6 pm.  
IV. Yoga—on any day of the week for one 4-hour session or for two 2-hour sessions.
6. If Manish goes for the 4-hour session of yoga, on which day of the week does he attend this class?
- (A) Friday  
(B) Monday  
(C) Thursday  
(D) Monday or Thursday  
(E) Monday or Friday
7. What is the maximum number of 2-hour yoga classes that are available for Manish to attend in a week, including all scenarios?

- (A) 4  
(B) 5  
(C) 6  
(D) at least 7  
(E) at most 8
8. The trainer comes to the yoga class on Tuesday; Manish attends at least one two-hour yoga session on that day. Which of the following classes can Manish attend, assuming that he has to stick to the slots and not mix slots and days?
- A. Cricket on Tuesday, Wednesday, Friday from 4:30 pm to 6 pm.  
B. Music on Tuesday, Wednesday, Friday from 2 pm to 4 pm.
- (A) A only  
(B) B only  
(C) A or B  
(D) A and B  
(E) Cannot be determined
9. If Manish attends the swimming class between 1 pm and 3 pm on all the days, when can he attend a 2-hour yoga class?
- (A) Tuesday and Wednesday  
(B) Wednesday and Friday  
(C) Tuesday and Friday  
(D) None of the above  
(E) A, B or C
10. A major part of the rabi crop in the district was damaged due to unseasonal heavy rains during the last few days of winter. Many farmers were committing suicide.

What decision do you think the head of the agriculture department should take?

- (A) The agriculture department should counsel the farmers.  
(B) The agriculture department should update the central government and wait for the Centre's directives.  
(C) It must be understood that the agriculture department could have done nothing as it was a force majeure.  
(D) The agriculture department should look at granting relief to the affected farmers by waiving loans and providing free seeds.

- (E) The agriculture department should waive loans and encourage the farmers to go to other parts of the country where rains are not heavy.

11. What is the value of the letter M in the given problem?

$$\begin{array}{r} M \quad 2 \quad N \\ \times \quad N \\ \hline 2 \quad 5 \quad 5 \quad N \end{array}$$

- (A) 1  
(B) 2  
(C) 4  
(D) 5  
(E) 6
12. The family residing in the flat adjacent to ours comprises of six people. The members are Arjun, Avinash, Sati, Savitri, Rahul and Ratul. Arjun is a doctor and the father of Rahul. Ratul is the grandfather of Avinash and an engineer. Sati is the grandmother of Rahul and a homemaker. There are two couples and the professions of the members are as follows: doctor, engineer, homemaker, consultant and two students.

Who is Ratul to Rahul?

- (A) Son  
(B) Father  
(C) Brother  
(D) Grandson  
(E) Grandfather

**Directions for Question 13:** In an encoder a sequence of numbers is fed and the following outputs are obtained at different stages of the encoder.

Input:	14	32	99	110	88	9	11	18
Stage 1:	11	14	32	99	110	88	9	18
Stage 2:	11	99	14	32	110	88	9	18
Stage 3:	11	99	110	14	32	88	9	18
Stage 4:	11	99	110	32	14	88	9	18
Stage 5:	11	99	110	32	9	88	14	18

13. If the output at Stage 1 is "31 19 47 86 39 13 66 69", then what is the output at Stage 5?
- (A) 31 66 47 19 86 13 39 69  
(B) 86 31 47 39 69 13 19 66  
(C) 31 86 39 47 66 13 19 69  
(D) 31 13 39 47 86 66 47 69  
(E) Cannot be determined

14. If the output at Stage 5 is "141 273 87 41 78 9 319 1012", then what is the input to the encoder?
- (A) 141 273 78 9 87 41 319 1012  
 (B) 319 41 273 87 9 78 141 1012  
 (C) 141 319 78 273 87 41 9 1012  
 (D) 41 78 273 9 141 87 319 1012  
 (E) Cannot be determined

15. If the output at Stage 4 is "wind flows over the river bed cool calm", then what is the output at Stage 2?

(A) cool calm river bed over flows the wind  
 (B) cool wind flows over the calm river bed  
 (C) river bed cool calm wind flows the over  
 (D) wind flows river the over bed cool calm  
 (E) Cannot be determined

16. If the output at Stage 2 is "system restart will happen in another 20 minutes", then what is the output at Stage 5?

(A) another 20 minutes system restart will happen in  
 (B) system restart in happen 20 another will minutes  
 (C) happen 20 minutes in another will system restart  
 (D) system restart will another 20 minutes in happen  
 (E) Cannot be determined

17. If 'WEDDING' is coded as 32 16 30, 'BELONGS' is coded as 19 225 40, then how is 'STRANGE' coded in the same code language?

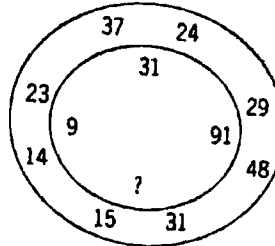
(A) 47 16 26  
 (B) 39 19 24  
 (C) 57 1 26  
 (D) 57 1 24  
 (E) 47 2 26

18. A company published an advertisement seeking applications from teachers for online tutoring assignments. The teachers needed to be experts in any one of the subjects: Mathematics, Physics, Chemistry or English. They also needed to be computer and internet savvy.

Which of the following assumptions is implicit in the given information?

(A) The computer industry is growing at a very fast pace.  
 (B) It is possible to be a teacher, as well as an online tutor.  
 (C) Some teachers of Biology can also become online tutors.

- (D) The company has received the maximum number of applications for Mathematics.  
 (E) Only the four subjects mentioned in the information can be taught in the online mode.
19. Which number should replace the question mark?



(A) 16  
 (B) 17  
 (C) 51  
 (D) 61  
 (E) 62

20. Which of the options that follow will replace the question mark (?) in the series given below?

(?) IJH NOM STR XYW  
 (A) ABZ  
 (B) DEB  
 (C) EDC  
 (D) DEC  
 (E) EDF

21. If 'Some More Is Good' is coded as 'ACEF', 'More Sugar Not Good' is coded as 'CEBD', 'Good More Is Bad' is coded as 'FCEI', 'Bad Is More Sure' is coded as 'IFCZ', then how is 'More Bad Is Not Good Sugar' coded as?

(A) ZFBIDC  
 (B) BFDICE  
 (C) ACFEIZ  
 (D) BDIZEF  
 (E) BIZAEF

22. The Chairman, Hamid Ansari, tried to restore order in the House and called for the first listed question of the day but BJP members were unrelenting. He then adjourned the House till noon.

What can be inferred from the above argument?

(A) BJP members like creating nuisance.  
 (B) No one cares what the chairman wants.  
 (C) Questions that are asked in the House are listed.  
 (D) The Chairman has the authority to adjourn the House.

(E) Adjourning of the House becomes essential when some members are unrelenting.

23. **Statement:** Should the Western way of life be adopted here in India?

**Arguments:**

- (I) No. The Western culture is quite different to the Indian culture, hence should not be blindly followed.
  - (II) Yes. We should be open to accepting the good from all cultures, and have a positive mindset.
  - (III) No. The West has already spoilt our people a lot and it's time we turned our backs on them.
- (A) Only (I) is strong.
  - (B) Only (II) is strong.
  - (C) Only (III) is strong.
  - (D) Both (I) and (II) are strong.
  - (E) None of them are strong.

24. Vikas took part in the discus throw event at the Olympics. After the first 3 throws, Vikas analysed the leader board. He realised that the athlete from Cyprus was ranked 5 places below him and the athlete from Tunisia was ranked 3 places above him. The athlete from Cyprus is actually 18<sup>th</sup> from the top and the Tunisian is 17<sup>th</sup> from the bottom. How many athletes took part in the competition if all the names are on the leader board?

- (A) 23
- (B) 25
- (C) 35
- (D) 37
- (E) 38

**Directions for Questions 25–28:** From the information provided below, answer the question that follows.

Mr Gates could schedule his business meetings with five clients Mittal, Murti, Aiyar, Ambani and Parekh only on the 31<sup>st</sup> of different months of the same calendar year, not necessarily in this order.

- 1. Every season except winter has one meeting.
- 2. Murti is slotted for the winter season but is on leave in December.
- 3. Mittal meets in the first month of the only two consecutive months when a meeting can take place.
- 4. Ambani is the last to meet Gates.
- 5. Aiyar meets just before the start of the rains.

**Consider the Indian seasons as:**

**Summer season**—April to June

**Rainy season**—July to September

**Winter season**—October to January

**Spring season**—February and March.

25. Who is scheduled for a meeting in August?

- (A) Ambani
- (B) Aiyar
- (C) Mittal
- (D) Murti
- (E) No one

26. For which month is Aiyar scheduled?

- (A) December
- (B) February
- (C) October
- (D) April
- (E) May

27. With whom will Mr Gates celebrate New Year's Eve night?

- (A) Ambani
- (B) Parekh
- (C) Aiyar
- (D) Mittal
- (E) Murti

28. Who has been scheduled for the rainy season?

- (A) Parekh
- (B) Ambani
- (C) Murti
- (D) Mittal
- (E) Aiyar

29. The Black Spider Monkey of Brazil has become endangered because of human activities such as, deforestation and logging, which causes destruction of the monkey's natural habitat.

Which of the following if true would weaken the above argument?

- (A) Costa Rican government is constantly trying to preserve the natural habitat of the squirrel monkeys in order to save them from extinction.
- (B) A certain allele (alternate gene) discovered in a black spider monkey pointed to micro-evolutionary extinction setting in.

- (C) Habitat loss in the Congo basin has seen no remarkable change in the count of Dryas monkeys in this region.
- (D) Habitat loss in the Congo basin has seen a decrease in the count of Dryas monkeys in this region.
- (E) WWF-funded protected areas have seen a slight revival in the number of the black spider monkey.

30. **Directions:** Given alongside are a few facts. Based on these facts, select from among the given statements, the statement that can be best concluded.

**Facts:**

**Fact 1:** Mr. Sethi has eight kids.

**Fact 2:** Two of them are studying computers.

**Fact 3:** Three of them are studying science.

**Fact 4:** Three of them are studying art.

**Fact 5:** Those who are studying science are inclined towards mechanics.

**Statements:**

- I. All of Mr. Sethi's eight kids are studying.
- II. Only three kids show an inclination towards mechanics.
- III. Mr. Sethi's kids study either science or computers or art.
- IV. Those who are studying art might also have an inclination towards mechanics.

- (A) Only (I) can be concluded.
- (B) Only (IV) can be concluded.
- (C) Both (II) and (III) can be concluded.
- (D) None can be concluded.
- (E) All can be concluded.

31. The more you practise, the more proficient you will become.

Which of the following strengthens the above statement?

- (A) She takes after her dad—she is as good in badminton as he is.
- (B) However much he tries to solve the questions, he just does not seem to be getting the hang of it.
- (C) No amount of practice is helping—I seem to be committing the same mistake over and over again.
- (D) She must be a genius. With a hectic schedule, she hardly gets time to practise and yet, she is one of the top contenders for the trophy.

- (E) Rajesh takes less than a minute to solve algebraic equations—he loves algebra and can be seen solving the practice questions for hours.

32. In the National Park, the white tigers hardly moved around, they always looked for opportunities to lie around.

From which of the following can the above statement be most properly inferred?

- (A) White tigers are usually known to be lazy.
- (B) The National Park makes the tigers active.
- (C) Only white tigers are known to hunt their food aggressively.
- (D) If an active tiger is seen at the National Park, it must not be the white tiger.
- (E) Due to their appearance, white tigers attract a lot of attention, which in turn makes them aggressive.

33. A multispeciality clinic was situated in the centre of a small town X, next to a leading software development company. The clinic was attending to and treating numerous patients and was earning a good profit. The software development company, which employed more than 10,000 people was abruptly shut down due to some litigation issues. After a year, the multispeciality clinic also started running into losses and ultimately closed down. The HOD stated that the reason for the losses was the closure of the software company.

Which of the following can be concluded from the passage above?

- (A) All the doctors of the multispeciality clinic left the town once the software company closed down.
- (B) After the closure of the software company, the multispeciality clinic was the only big employer in the town.
- (C) The people in the town, even if unemployed, continued to be treated at the multispeciality clinic and were also paying for the treatment.
- (D) The closure of the software company led to the loss of patients at the multispeciality clinic as most of the diseases originated in the software company.
- (E) The chief reason for the closure of the multispeciality clinic was the unemployment of the majority of the population in the town as they were not able to afford expensive treatments.

34. **Directions:** Given alongside is a statement followed by a few suggested courses of action. For the given situation, select the best course of action that follows.

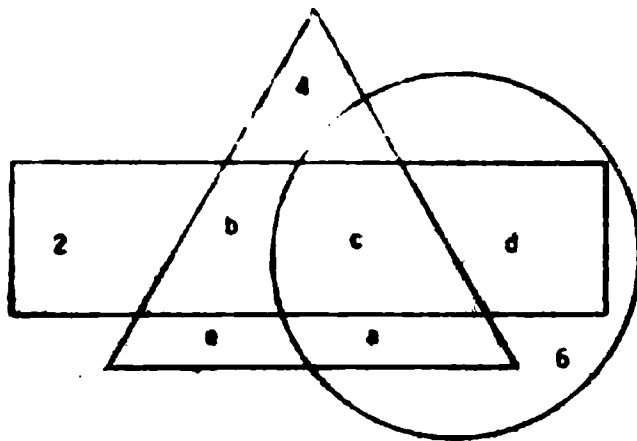


**Statement:** There is quiet unrest among people today—it will be no surprise if this simmering discontent turns into some kind of violent protest.

**Courses of Action:**

- I. The government needs to be sharp and realize the mood of its people—it should take steps to address the existing pain points and not allow anything to snowball.
  - II. The government should carry on with its work as usual—unrest in people is obvious when things become difficult.
  - III. The government needs to focus on the economy—everything else will fall into place.
- (A) Only I should be pursued.
  - (B) Only II should be pursued.
  - (C) Only III should be pursued.
  - (D) Both II and III should be pursued.
  - (E) None should be pursued.

35. **Directions:** Use the following diagram to answer the given question. The overlapped area suggests the product of the numbers of each figure in the diagram.



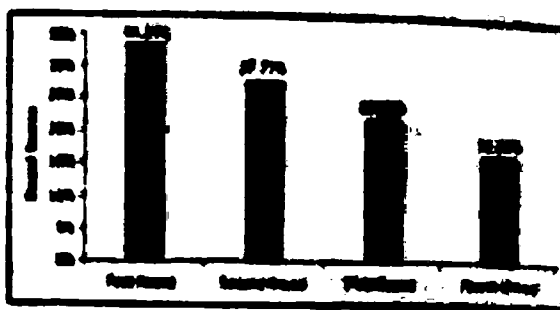
The value of which of the following is the minimum?

- (A) a
- (B) b
- (C) c
- (D) d
- (E) e

**Directions for Questions 36–39:** Answer the questions using the information given below.

In 'Famous Casino' situated in Monte Carlo, three friends A, B and C are playing with a fair die, which has the numbers 1, 2, 3, 4, 5 and 6 marked on its six faces. Turn by turn, each one of them rolls the die once and notes down the outcome

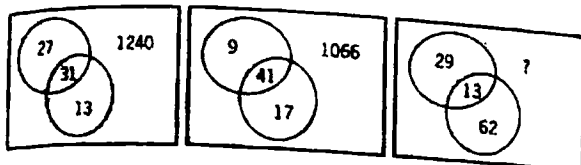
obtained. At the end of the first three rolls, a 'round' gets completed. The players roll the die to complete three more such rounds. For each round, the 'round score' is defined as the sum of the three outcomes obtained in that round. The following chart represents the 'round scores' of the rounds expressed as a percentage of the maximum possible round score.



36. Which of the following outcomes could never have been obtained by A in any of the four rounds?
- (A) 1
  - (B) 2
  - (C) 3
  - (D) 4
  - (E) 5
37. In the third round, what percentage of the round score was contributed by the outcome of B?
- (A) 25%
  - (B) 33%
  - (C) 50%
  - (D) 60%
  - (E) Cannot be determined
38. It is given that a particular pair of players obtained the same outcome in each of the four rounds. What was the outcome obtained by the other remaining player in the second round?
- (A) 1
  - (B) 2
  - (C) 3
  - (D) 4
  - (E) Cannot be determined
39. In the first round, C was the first player to roll the die. In the subsequent rounds, the die was rolled for the first time by the player who obtained the largest number as the outcome in the previous round. In the subsequent rounds, if C never got the honour of rolling the die for the first time, which of the following could be the sum of the four outcomes obtained by C?

- (A) 5
- (B) 6
- (C) 7
- (D) 8
- (E) None of these

40. Which number can substitute the question mark?



- (A) 3250
- (B) 3057
- (C) 2224
- (D) 1728
- (E) 1183

# Answer Key

## Language Skills

1. **Directions:** In the given question, the sentence has four underlined words or phrases. Identify the one underlined word or phrase that must be changed in order to make the sentence correct. Mark E for no error.

I wonder if you can give me an information about a certain Mr. Roy who used to live here.

- (A) if
- (B) an
- (C) a
- (D) to
- (E) No error

The correct word should be *any* information.

The correct answer is B.

### Passage for Questions 2–5

Cancer, a word that elicits dread in nearly everyone, continues to puzzle scientists. Despite attempts made by science to decipher this terrible disease, scientists still struggle to find an answer to questions such as, 'why does cancer strike some and not others?', 'Are its 'seeds' part of our genetic makeup?'

Different terms are used when discussing cancer. *Neoplasm* is an abnormal cell mass that develops when the controls of the cell cycle and cell division malfunction. However, all neoplasms are not cancerous. *Benign* neoplasms do not spread, and are always seen to be local affairs. They are usually surrounded by a capsule and grow slowly, seldom killing their hosts if they are removed before they affect vital organs. *Malignant* neoplasms, on the other hand, are non-encapsulated, grow more relentlessly and can even kill. They resemble immature cells and invade their surroundings rather than push them aside. Malignant cells are also capable of *metastasis*—that is, they tend to spread via blood to distant parts of the body and form new masses.

But what causes the *transformation*? In other words, what converts a normal cell to a cancerous one? It is well known that cancer-causing elements or *carcinogens* can be found in radiation, mechanical trauma, certain viral infections and many chemicals (tobacco tars, saccharine). All of these have one common factor—all of them cause mutations, which are changes in DNA that alter the expressions of certain genes. Usually carcinogens are eliminated by the immune system or certain enzymes. It must also be stated here that it takes

much more than just one mutation to change a normal cell into a full-fledged cancer cell.

It was with the discovery of *oncogenes* (cancer causing genes) followed by *proto-oncogenes* that the role of genes started to gain prominence. Although proto-oncogenes code for proteins that are needed for normal cell division and growth, many of them have fragile areas that break when exposed to carcinogens, converting them to oncogenes. As a result, problems such as, 'switching on' of dormant genes that allows cells to become invasive, arise. Oncogenes have been discovered in only 15 to 20 percent of human cancers. Therefore, it came as no surprise when the tumour suppressor genes were discovered recently – these, as their names suggest, suppress or prevent cancer. The tumour suppressor genes not only put the 'brakes' on cell division but they help with DNA repair and help to deactivate carcinogens, thereby enhancing the immune system's ability to destroy cancer cells. It is when the tumour suppressor genes are damaged or changed in some way, that the oncogenes are free to 'do their thing'. Whatever the precise genetic factor at work, the seeds of cancer do appear to be in our own genes. Cancer is indeed intimate!

**Topic:** Cancer

**Scope:** The connection between genes and cancer

### Passage Map

- P1:** Asks questions pertinent to cancer
- P2:** Describes the types of cancer
- P3:** Explains how a normal cell transforms into a cancerous cell
- P4:** Gives one reason how our genes may help prevent or indirectly cause cancer

2. What is the central idea of the passage?

- (A) evolution of cancer
  - (B) role of genes in cancer
  - (C) early warning signs of cancer
  - (D) procedures for detecting cancer
  - (E) how an abnormal cell mass can cause cancer
- B summarises the central idea identified by us in our topic and scope best and should be the correct answer.

The correct answer is B.

3. According to the passage, cancer is an 'intimate enemy' because:

- (A) of the kind of treatment available for cancer.
- (B) most of us know someone who has had cancer.
- (C) it is closely related to the body's immune system.
- (D) it brings people affected by cancer closer together.
- (E) the 'seeds' of cancer appear to be in our own genes.

The answer is clearly provided in the last two sentences of the passage—'Whatever the precise genetic factor at work, the seeds of cancer do appear to be in our own genes. Cancer is indeed intimate'.

The correct answer is E.

4. According to the author, what can be concluded from the passage?

- (A) Occurrence of cancer depends on our genetic make-up.
- (B) Abnormal masses in the body are the sole reason for cancer.
- (C) Cancer has now become a very common disease and can be treated easily.
- (D) There are several factors that cause cancer and genes play a significant role.
- (E) Though cancer is a dreadful disease, there are several promising new treatments.

An option such as A is extreme because the author never says that it is only genes that cause cancer. There could be other ways of developing cancer as well. D looks best because it is a very open ended option that cannot really be falsified or denied.

Note: Remember to avoid extreme or strongly worded options on Inference questions.

The correct answer is D.

5. According to the passage, the author most likely agrees with all of the following statements EXCEPT:

- (A) Surgical removal is a treatment for neoplasm.
- (B) It takes only one genetic mutation to make a normal cell cancerous.
- (C) Most carcinogens are eliminated by enzymes or the immune system.
- (D) Carcinogens cause changes in DNA that alter the expression of genes.
- (E) Chemicals such as tobacco tar and saccharine can act as carcinogens.

Option B is clearly contradicted by the following sentence in the third paragraph—"It must also be

stated here that it takes much more than just one mutation to change a normal cell into a full-fledged cancer cell." Thus, the author will not agree with option B.

The correct answer is B.

6. Select the word that is nearly the opposite in meaning to the given word: *parsimonious*

- (A) greedy
- (B) Parisian
- (C) penurious
- (D) tight-fisted
- (E) philanthropic

*Parsimonious* means a miser or someone who doesn't like to spend money. The opposite of this should be *philanthropic*.

The correct answer is E.

7. Select the word that is nearest in meaning to the given word: *prescribe*

- (A) bundle
- (B) betray
- (C) deceive
- (D) stipulate
- (E) admonish

*Prescribe* means to suggest or recommend. *Stipulate* fits this best.

The correct answer is D.

8. Directions: Rearrange the jumbled sentences to show the appropriate sequence.

- (A) While a luxury one usually starts with fish—pickled herring, smoked eel or hot fried plaice.
- (B) Danish food includes a variety of open sandwiches.
- (C) The sandwiches are traditionally served for the mid-day meal.
- (D) An ordinary mid-day meal consists of just a simple sandwich prepared during breakfast and packed in a lunch box.
- (E) The cuisine of Denmark stems from the country's agricultural past, as well as its geography and climate.

- (A) EDBCA
- (B) ABCDE
- (C) EBCDA
- (D) DECAB
- (E) BEDAC

E should be the starting sentence since the underlying theme of all the sentences is Danish cuisine. CD is a logical pair since C talks about mid-day meal that D further elaborates upon. Option C has to be the correct answer then because it is the only option that starts with E and contains the logical pair CD.

**The correct answer is C.**

9. **Directions:** Rearrange the jumbled sentences to show the appropriate sequence.

- (A) Most of these places are high up on mountains.
- (B) This hardened ice is what comprises the glacier.
- (C) Repeated snowfalls compress the lower layers of snow.
- (D) Glaciers form in extremely cold places.
- (E) Finally, the lowest layer hardens and turns into ice.

- (A) ABEDC
- (B) DCEBA
- (C) CADEB
- (D) CBDAE
- (E) DACEB

DA is a logical pair since A describes the places mentioned in D. This brings us to options D and E. It doesn't make sense starting the paragraph with C. The entire paragraph talks about glaciers. Thus, D should be the perfect starting sentence, making option E the correct answer.

**The correct answer is E.**

10. **Directions:** Rearrange the jumbled sentences to show the appropriate sequence.

- (A) The hedgehog population in the UK has drastically fallen from 30 million in the 1950s to about 1.5 million in 2011, and Britons may not see any more red squirrels in 20 years' time, according to a report.
- (B) In general, according to the report, the situation has improved for species restricted to habitats that could benefit from site-based conservation and has worsened for many widespread species such as hedgehogs and red squirrels.
- (C) However, the future of otters, bats and water voles is not as bleak as their populations have increased, thanks to improving conservation efforts.
- (D) The report 'State of Britain's Mammals 2011' by Oxford University's wildlife conservation unit also shows that the dwindling population of

the common dormouse and mountain hare is threatened.

- (E) A ban on chemicals used in sheep dip in the late 1990s, for instance, has resulted in cleaner rivers in Britain, which in turn, has benefitted otters.
- (A) ADBCE
- (B) ADCEB
- (C) ABCED
- (D) ABDCE
- (E) DABCE

AD is a logical pair since they both highlight problems faced by certain species. E and B need to come after C, since they both talk about positive results and C brings this contrast out by using the word *however*. Thus, option B should be the correct answer.

**The correct answer is B.**

**Directions for Questions 11–12:** In the given question the sentence has four underlined words or phrases. Identify the one underlined word or phrase that must be changed in order for the sentence to be correct. Mark (E) for no error.

11. Only about a hundred out of an estimating 3,000 known mineral species have been found at least reasonably suitable for use as gems.
- (A) estimating
  - (B) been found
  - (C) reasonably
  - (D) for use
  - (E) No error

The correct word should be *estimated*, since the mineral species are not *estimating* anything.

**The correct answer is A.**

12. Shivering from the cold and trembling with fatigue, the old man begged permission to lay down awhile before moving on.
- (A) with fatigue
  - (B) begged permission
  - (C) lay down
  - (D) awhile
  - (E) No error

You ask permission to *lie* down and not *lay* down.

**The correct answer is C.**

Directions for Questions 13–14: Choose the set of prepositions whose meaning and sequence best fits the 3 given sentences.

13. 1. A problem exists when we become aware of the difference \_\_\_\_\_ the reality and our desires.  
 2. Individuals differ \_\_\_\_\_ one another in their ability to understand complex ideas.  
 3. IQ tests were mainly designed \_\_\_\_\_ identifying mentally challenged children.

- (A) for  
 (B) from  
 (C) besides  
 (D) through  
 (E) towards  
 (F) between  
 (A) CEB  
 (B) AFD  
 (C) FBA  
 (D) DAC  
 (E) FAC

There can be a difference between two things.

You differ from something.

Something was designed for a particular purpose.

The correct answer is C.

14. 1. Good management comprises an array \_\_\_\_\_ practices and experience.  
 2. You must focus \_\_\_\_\_ your objectives.  
 3. This is a serious matter and should not be pushed \_\_\_\_\_ the carpet.

- (A) at  
 (B) of  
 (C) in  
 (D) on  
 (E) under  
 (F) although  
 (A) ADB  
 (B) ABD  
 (C) BDE  
 (D) CDE  
 (E) ACB

The correct expression is an array of something.

You focus on something.

Something can be pushed under the carpet.

The correct answer is C.

Directions for Questions 15–16: Choose the word or set of words for each blank that best fits the meaning of the sentence as a whole.

15. We need to \_\_\_\_\_ in a few stops to stretch our legs when we determine how long it will take to drive to Aunt Suzy's house.

- (A) issue  
 (B) factor  
 (C) manage  
 (D) acquire  
 (E) intimidate

The correct phrase should be to take into consideration or to account for. B fits this best and should be the correct answer.

The correct answer is B.

16. The robber \_\_\_\_\_ the location of the stolen money after being questioned for several hours.

- (A) emerged  
 (B) expected  
 (C) concealed  
 (D) disclosed  
 (E) threatened

The correct word should be revealed. Disclosed matches this best and should be the correct answer.

The correct answer is D.

17. Select the word or phrase that is nearly the opposite in meaning to the given word: *irascible*

- (A) outgoing  
 (B) agreeable  
 (C) friendly  
 (D) benign  
 (E) patient

*Irascible* means cantankerous or someone who gets irritated easily. The best antonym then should be *agreeable* or a person who is relaxed and amiable.

The correct answer is B.

18. Select the word or phrase that is nearest in meaning to the given word: *affront*

- (A) abstruse  
 (B) examine  
 (C) forbear

(D) scorn

(E) yield

*Affront* is to offend or insult someone. The best fit then should be *scorn*, which is the only word with a negative connotation in the list.

The correct answer is D.

19. **Directions:** In the given question, the sentence has four underlined words or phrases. Identify the one underlined word or phrase that must be changed in order to make the sentence correct. Mark E for no error.

Retiring C.E.O. Hira Byebye asked his managers to take interest in the management after his retirement.

(A) Retiring C.E.O.

(B) asked his

(C) interest

(D) after his retirement.

(E) No error

The correct construction should be *soon to retire CEO* or *about to retire CEO*

The correct answer is A.

20. **Directions:** Choose the word or pair of words that best completes the relationship to the given pair.

pre-empt : anticipation :: \_\_\_\_\_ : \_\_\_\_\_

(A) plan : debriefing

(B) recruit : position

(C) study : opportunity

(D) inoculate : vaccination

(E) quarantine : prognosis

Pre-empt is to take action in order to prevent something and anticipation is the expectation or prediction of something occurring.

Quarantine is taking action in order to prevent something (disease) and prognosis is a medical term that means predicting the likely outcome of something (effects of a disease).

The correct answer is E.

21. Select the word or phrase that is nearly the opposite in meaning to the given word: *sibylline*

(A) unprophetic

(B) perceptive

(C) eloquent

(D) palpable

(E) overt

*Sibylline* means oracular or prophetic. The best antonym then has to be *unprophetic*.

The correct answer is A.

22. **Directions:** Rearrange the jumbled sentences to show the appropriate sequence.

(A) In fact, experts advise a comprehensive recruitment policy so as to avoid bad hires.

(B) The recruitment process of any company begins when the need for human resources is determined.

(C) They then end up hiring rather than recruiting.

(D) This in turn leads to bad recruitment.

(A) ABCD

(B) ACBD

(C) ADBC

(D) BADC

(E) BCDA

DA is a logical pair since A talks about the *bad hires* mentioned in D. This gives us the answer as option E.

The correct answer is E.

**Directions for Questions 23–24:** Choose the set of prepositions whose meaning and sequence best fits the 3 given sentences.

23. 1. The manager's eye lingered \_\_\_\_\_ the new recruit.

2. He was looking \_\_\_\_\_ Tom for instructions.

3. She shivered \_\_\_\_\_ fear.

(A) on

(B) under

(C) to

(D) at

(E) in

(F) by

(A) ACE

(B) AEC

(C) CBA

(D) DAE

(E) FED

Your eyes linger *on* someone

You look *to* someone for instructions or orders

You shiver *with* or *in* fear.

The correct answer is A.

24. 1. Rituparno is waiting for his friend \_\_\_\_\_ the hospital.  
 2. Rituparno is \_\_\_\_\_ the hospital.  
 3. He is mad \_\_\_\_\_ cleanliness and hygiene.  
 (A) in  
 (B) on  
 (C) at  
 (D) into  
 (E) about  
 (F) over  
 (A) ABF  
 (B) ACF  
 (C) ADB  
 (D) CDE  
 (E) CAE

You wait at a place

Someone is *in* the hospital or office

You are mad *about* something.

The correct answer is E.

#### Passage for Questions 25–28

According to Wimsatt and Beardsley, even though the influence of the author's 'intention' upon the critic's opinion has been disputed in a number of discussions, it is doubtful whether most of its 'romantic corollaries' are widely subject to questioning. The author duo finds the design or intention of the author neither accessible nor desirable as a yardstick for judging the accomplishment of a literary text. They define 'intention' as "design or plan in the author's mind. Intention has obvious affinities for the author's attitude toward his work, the way he felt, what made him write."

Even though a text comes into existence only through the medium of an author, it is erroneous to assign the author's design to the status of a standard by which critics are to evaluate the text. Besides, the question arises as to how a critic is to find out the 'intention' behind a text. Wimsatt and Beardsley believe that if the poet was successful in bringing out his intention through the words he had written, it must be evident in the poem itself. And if the poet was not successful in doing so, the critic must move outside the text to search for the intention. Unlike practical messages, which are successful only if the readers correctly infer the intention of the author, poems should just be, not mean.

Another argument that the duo puts forward is regarding the process of revision. Authors often revise their work, thereby creating multiple versions of the same text. This raises the question of which intention is to be considered by the critics. By extension, it raises the question of whether the author's former concrete intention was not his intention".

Wimsatt and Beardsley conclude that a text is neither the critic's nor the author's. It is detached from the author at birth and goes about the world beyond his power of intention or ability to control it. The poem belongs to the public. It comes to life through language, which is the peculiar possession of the public and it is about the human being, which is an object of public knowledge.

**Topic:** Author's intention in a text or poem

**Scope:** Whether the intention of the author actually comes through in a text

#### Passage Map

**P1:** Provides an introduction to Wimsatt and Beardsley and their point of view

**P2:** Provides one argument of Wimsatt and Beardsley

**P3:** Provides another argument put forward by Wimsatt and Beardsley

**P4:** Describes Wimsatt and Beardsley's point of view on the matter

25. The passage is primarily concerned with:
- (A) an evaluator's paradigm for evaluation.
  - (B) the worth of the objective at the source.
  - (C) public knowledge regarding a literary text.
  - (D) the significance of Wimsatt and Beardsley's ideas.
  - (E) the question regarding the revision of literary texts.

B summarises our thought in the topic and scope defined earlier the best and should be the correct answer.

The correct answer is B.

26. The author mentions all of the following EXCEPT:
- (A) the work of the author belongs to the public.
  - (B) language gives life to a piece of literary work.
  - (C) critics consign meaning to books and poems.
  - (D) no one has ever questioned the intention of the poet.
  - (E) practical passages require an understanding of the author's intention.

Option D is not mentioned anywhere in the passage and so should be the correct answer. The other options are all mentioned in the passage.

The correct answer is D.

27. According to the passage, the author most likely agrees with all of the following statements EXCEPT:
- (A) the intention of the author is redundant.



- (B) a text is never for the author to call his own.
- (C) the author's intention must always be preserved.
- (D) the author's attitude towards his work is set in stone.
- (E) authors often revise their work creating multiple versions of the text.

The author actually states the opposite of C, as is clear in the last paragraph of the passage.

**The correct answer is C.**

28. What is meant by the statement that "The poem belongs to the public"?

- (A) The author writes only for the public.
- (B) Critics can never influence the public's ideas.
- (C) The public assigns meaning to a work of literature.
- (D) Literature can be possessed only by the public.
- (E) Authors and critics are outside the public domain.

The entire point being made by the passage is that meaning of a poem or story is what the reader ascribes to it and not what the author intended.

C states this best and should be the correct answer.

**The correct answer is C.**

**Directions for Questions 29–32:** The following passage has blanks that have been numbered (1) to (4). From the given words, fill in the blanks with the most appropriate words.

\_\_\_\_\_(1)\_\_\_\_\_, these modern tools of communication can also be tools of \_\_\_\_\_(2)\_\_\_\_\_, making us feel so out of touch, so much more in need of real human contact. If a computer message came addressed as simply "Hi", I'd feel forgotten and \_\_\_\_\_(3)\_\_\_\_\_. If however, a more personalised message or call were to come, it would \_\_\_\_\_(4)\_\_\_\_\_ my day and make me feel like I was part of their family unit after all.

29. \_\_\_\_\_(1)\_\_\_\_\_

- (A) Ironically
- (B) Naturally
- (C) Fastidiously

- (D) Suspiciously
- (E) Contemptuously

There is a contrast being brought out in the sentence. Thus, *ironic* fits in best.

**The correct answer is A.**

30. \_\_\_\_\_(2)\_\_\_\_\_

- (A) elevation
- (B) alienation
- (C) allegation
- (D) alleviation
- (E) mollification

The prediction should be on the lines of *isolation*. *Alienation* fits in best then.

**The correct answer is B.**

31. \_\_\_\_\_(3)\_\_\_\_\_

- (A) discernible
- (B) neglected
- (C) negligent
- (D) forgiven
- (E) omitted

The prediction should be *ignored*. *Neglected* fits in best.

**The correct answer is B.**

32. \_\_\_\_\_(4)\_\_\_\_\_

- (A) enlighten
- (B) brighten
- (C) lighten
- (D) signify
- (E) burden

The prediction is that the word needs to be a positive word signifying happiness. *Brighten* fits in best.

**The correct answer is B.**

# Quantitative Skills

1. **Directions:** A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

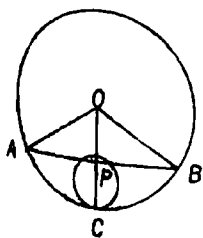
What is the selling price of the mixture if the ratio of the two qualities of tea mixed is 3:4?

- (1) Cost price of the first quality of tea is Rs 180 per kg.  
 (2) Cost price of the second quality of tea is Rs 225 per kg.  
 (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.  
 (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.  
 (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
 (D) EACH statement ALONE is sufficient.  
 (E) Statements (1) and (2) TOGETHER are NOT sufficient.

The two statements simply give the cost price of the two types of tea. However, from the cost price we cannot get any idea of the selling price. Thus, both the statements together are NOT SUFFICIENT to answer the question asked.

The correct answer is E.

2. In the given figure,  $O$  is centre of the larger circle of radius 10 cm while  $P$  is the centre of the smaller circle. If  $AB = 10\sqrt{2}$  cm, find the area of segment  $ABC$  lying outside the smaller circle.



- (A)  $22.5\pi - 25$   
 (B)  $22.5\pi - 50$   
 (C)  $45\pi - 25$   
 (D)  $45\pi - 50$   
 (E)  $45\pi - 100$

Let  $OC$  meet  $AB$  at  $D$ , as we have right triangle  $ODB$ .  
 So,  $OD^2 + DB^2 = OB^2$ .

$$OB = 10,$$

$$DB = 10\sqrt{2}/2 = 5\sqrt{2}.$$

$$\text{So, } OD = 5\sqrt{2}$$

Now in triangle  $ODB$ ,  $OD = DB$  and similarly  $OD = AD$ .  
 So, we can say  $\angle B = \angle DOB = 45^\circ$

$$\text{Similarly } \angle C = \angle DOC = 45^\circ$$

$$\text{So, } \angle AOB = 90^\circ \text{ www}$$

$$\text{So, area of sector } AOB = \frac{1}{4} \pi (10)^2 = 25\pi$$

$$\text{Area of segment } ABC = \text{Area of sector } AOB - \text{area of triangle } OAB$$

$$= 25\pi - \frac{1}{2} \times 10 \times 10$$

$$= 25\pi - 50$$

Area of segment  $ABC$  lying outside smaller circle is  
 area of segment  $ABC - \text{area of smaller circle}$

Now for smaller circle diameter is  $DC$  and we have  
 $OC = OD + DC$

$$DC = 10 - 5\sqrt{2}$$

$$\text{So, radius of smaller circle is } (10 - 5\sqrt{2})/2 = (5 - 5/\sqrt{2})$$

$$\begin{aligned} \text{So, the required area} &= (25\pi - 50) - \pi(5 - 5/\sqrt{2})^2 \\ &= 25\pi - 50 - \pi(25 + 25/2 - 25\sqrt{2}) \\ &= (25\sqrt{2} - 12.5)\pi - 50 \\ &= 22.5\pi - 50 \end{aligned}$$

The correct answer is B.

3. Find the smallest 4-digit number which, when increased by 8, is divisible by 12, 18, 30 and 45.

- (A) 1,072  
 (B) 1,080  
 (C) 1,088  
 (D) 1,096  
 (E) 1,120

The LCM of 12, 18, 30 and 45 is 180. Thus, the answer has to be 8 less than a multiple of 180.

$1080 - 8 = 1072$  is the only number that fits and should be the correct answer.

The correct answer is A.

4. Fahim and Farhan together earned Rs 37,570 from a business venture. They divided it and each deposited his share in a bank. At the end of 9 years the amount Farhan had in the bank was the same as the amount Fahim had at the end of 7 years. If the interest was compounded annually at 10% per annum, what was Farhan's share of the money earned from the business venture?

- (A) Rs 14,174  
(B) Rs 16,437  
(C) Rs 17,000  
(D) Rs 18,785  
(E) Rs 20,570

Let the share of Farhan be  $x$ , then share of Fahim must be  $(37,570 - x)$

Now, both invested money at the same compound rate at an interest of 10%

According to given condition,  $x(1 + 10\%)^9 = (37,570 - x)(1 + 10\%)^7$

So,  $x(1 + 10\%)^2 = 37,570 - x$

So,  $x(1.1)^2 = 37,570 - x$

$1.21x = 37,570 - x$

Solving it we get  $x = \text{Rs. } 17,000$

**The correct answer is C.**

5. A tank can be filled by Pipe 1 in 7 hours and by Pipe 2 in 5 hours. There is a waste pipe which is kept open when Pipe 2 is working; the tank then takes 8 hours 30 minutes to fill. What is the approximate time taken to fill the tank if all the three pipes are working?

- (A) 3 hours 20 minutes  
(B) 3 hours 50 minutes  
(C) 4 hours 15 minutes  
(D) 4 hours 50 minutes  
(E) 5 hours 30 minutes

Pipe 1 can fill  $1/7$  of tank in 1 hour

Pipe 2 can fill  $1/5$  of tank in 1 hour

Pipe 2 and the waste pipe together fill  $1/8.5$  of tank in 1 hour

So, waste pipe can empty the tank in 1 hour  $= (1/5 - 1/8.5)$  of tank  $= 0.7/8.5$  of tank

If all the pipes are working together, in 1 hour the tank filled is  $1/7 + 1/5 - (0.7/8.5) = 1/3.84$  of tank.

So, the tank will be filled in 3.84 hours = 3 hours 50 minutes.

**The correct answer is B.**

6. In a shop, there are 500 sweet products. 210 are biscuit-based, 160 are milk-based and 160 are coconut-based. 80 have both milk and coconut but no biscuit, 70 have milk and biscuit but no coconut, 60 have biscuit and coconut but no milk. How many items have all three ingredients if 200 have none of these ingredients?

- (A) 10  
(B) 30  
(C) 50  
(D) 130  
(E) Cannot be determined

Total = 500

Biscuit based = 210

Milk based = 160

Coconut based = 160

Milk and coconut = 80

Milk and biscuit = 70

Biscuit and coconut = 60

All three =  $x$

None = 200

Now, the formula is

Total - None =  $A + B + C - (AB + BC + CA) + 2(ABC)$

Or  $500 - 200 = 210 + 160 + 160 - (80 + 70 + 60) - 2x$

Or,  $300 = 530 - 210 - 2x$

Or,  $2x = 320 - 300$

Or,  $x = 20/2 = 10$

**The correct answer is A.**

7. If the roots of the equation  $ax^2 + bx + c = 0$  are reciprocal of the roots of the equation  $px^2 + qx + r = 0$ , then which of the following represents relation(s) between  $a, b, c, p, q$  and  $r$ ?

(A)  $a = \frac{1}{p}$

(B)  $b = \frac{1}{q}$

(C)  $c = \frac{1}{r}$

(D)  $a = p, c = r$  and  $b = 1$

(E)  $a = r, c = p$  and  $b = q$

Let the roots of equation  $ax^2 + bx + c = 0$  be  $m$  and  $n$ .

Then roots of equation,  $px^2 + qx + r = 0$  are  $1/m$  and  $1/n$

Now,  $m + n = -b/a$  and  $mn = c/a$

$$1/m + 1/n = -q/p \text{ and } 1/mn = r/p$$

$$\text{Also, } 1/m + 1/n = (m + n)/mn.$$

$$\text{So, } -b/c = -q/p \text{ and also } c/a = p/r$$

By these relations we get  $a = r$ ,  $c = p$  and  $b = q$

The correct answer is E.

8. Which of the following represents  $\frac{(2n)!}{n!}$ ?

(A)  $1 \ 3 \ 5 \ \dots \ (2n - 1)(2^n)$

(B)  $1 \ 3 \ 5 \ \dots \ (2n + 1)(n!)$

(C)  $1 \ 3 \ 5 \ \dots \ (2n + 1)(2n)$

(D)  $1 \ 3 \ 5 \ \dots \ (2n + 1)(2n)(n!)$

(E)  $1 \ 3 \ 5 \ \dots \ (2n - 1)(24)(n!)$

Let  $n = 5$ . So,  $\frac{(2n)!}{n!} = (2 \times 5)!/5! = 10!/5! = 10 \times 9 \times$

$8 \times 7 \times 6 = 30240$ —this is the desired answer.

Now check the answer choices by replacing the value of  $n = 5$

$1 \ 3 \ 5 \ \dots \ (2n - 1)(2n) = 1 \times 3 \times 5 \times 7 \times 9 \times 32 = 30240$

$1 \ 3 \ 5 \ \dots \ (2n + 1)(n!) = 1 \times 3 \times 5 \times 7 \times 9 \times 11 \times 5 \times 4 \times 3 \times 2 \times 1 = 1247400$

$1 \ 3 \ 5 \ \dots \ (2n + 1)(2n) = 1 \times 3 \times 5 \times 7 \times 9 \times 11 \times 32 = 332640$

$1 \ 3 \ 5 \ \dots \ (2n + 1)(2n)(n!) = 1 \times 3 \times 5 \times 7 \times 9 \times 11 \times 32 \times 5 \times 4 \times 3 \times 2 \times 1 = 39916800$

$1 \ 3 \ 5 \ \dots \ (2n - 1)(24)(n!) = 1 \times 3 \times 5 \times 7 \times 9 \times 16 \times 5 \times 4 \times 3 \times 2 \times 1 = 1814400$

Therefore, we see that only the first choice matches our desired answer.

The correct answer is A.

9.  $(0, 4\sqrt{3} - 3)$  and  $(-4, -3)$  are vertices of an equilateral triangle. Which of the following could be the co-ordinates of the third vertex?

(A)  $(-4, 3)$

(B)  $(-4, -4\sqrt{3})$

(C)  $(4, 3)$

(D)  $(4, -3)$

(E)  $(4, 4\sqrt{3})$

Note that the point  $(0, 4\sqrt{3} - 3)$  lies on the y axis and the point  $(-4, -3)$  lies in the third quadrant. The easiest way to form an equilateral triangle would be to take the mirror image of either of these two points to the opposite quadrant, that is,  $(0, -4\sqrt{3} - 3)$  or  $(4, -3)$ . Option D gives us one of these two options and so should be the correct answer.

The correct answer is D.

10. When 5, 8 and 12 divide a multiple of 13, they leave remainders of 3, 6 and 10, respectively. What is the least such number?

(A) 169

(B) 478

(C) 598

(D) 1,298

(E) 1,602

It's fastest if you try all the given options. The divisibility by 5 criteria will bring you down to B, C and D. B and D do not leave a remainder of 10 when divided by 12. Only C does so and should be the correct answer.

The correct answer is C.

11. The production of rice increased by 75% from 1990 to 1995. From 1995 to 2000, there was a 100% increase. What is the percentage increase in the production of rice from 1990 to 2000?

(A) 250%

(B) 280%

(C) 285%

(D) 290%

(E) 295%

Let the production of rice in 1990 be 100 tonnes.

Then, the production of rice in 1995 =  $100 \times 1.75 = 175$  tonnes

And the production of rice in 2000 =  $175 \times 2 = 350$  tonnes

Thus the percentage increase in production from 1990 to 2000 =  $(350 - 100)/100 \times 100 = 250\%$

The correct answer is A.

12. What is the area of a regular hexagon whose perimeter is 12 inches?

(A)  $216\sqrt{3} \text{ in}^2$

(B)  $36\sqrt{3} \text{ in}^2$

(C)  $12\sqrt{3} \text{ in}^2$

(D)  $6\sqrt{3} \text{ in}^2$

(E)  $4\sqrt{3} \text{ in}^2$

Side of the hexagon =  $12/6 = 2 = a$

$$\begin{aligned} \text{Area of a hexagon} &= (3\sqrt{3}/2)a^2 \\ &= (3\sqrt{3}/2)2^2 \\ &= 6\sqrt{3} \text{ in}^2 \end{aligned}$$

The correct answer is D.

13. If  $(XY)^2 = PQX$ , where each letter represents a distinct digit, then find  $P + Q$ .
- (A) 5  
(B) 6  
(C) 7  
(D) 8  
(E) 9

It will help if you remember your squares here. Since the result is a 3 digit number, the maximum value for  $XY$  can be 31 since  $31^2 = 961$  and  $32^2 = 1024$ .

Now, you need to check for each number from 11 to 31 and find the number whose first digit is the same as the last digit of its square (as given in the questions). The only such number is 19 ( $19^2 = 361$ )

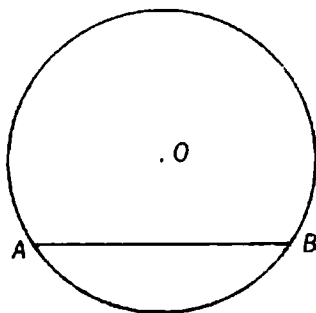
Thus,  $P = 3$ ;  $Q = 6$  and  $X = 1$

And  $P + Q = 3 + 6 = 9$

**The correct answer is E.**

14. **Directions:** This problem consists of a question and two statements, labelled (1) and (2), in which certain data are given. You have to decide whether the data given in the statements are sufficient for answering the question. Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

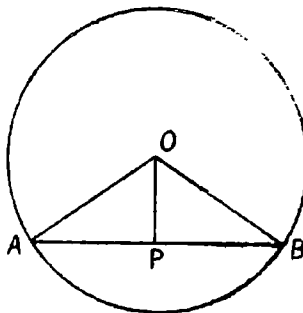
The radius of circle  $O$  below is 8 cm. What is the area of the minor segment?



- (1) The chord  $AB$  subtends an angle greater than  $90^\circ$  at the centre.  
(2)  $AB = 8\sqrt{3}$  cm
- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.  
(B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.  
(C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.  
(D) EACH statement ALONE is sufficient.  
(E) Statements (1) and (2) TOGETHER are NOT sufficient.

Statement 1 does not provide us any valuable information and is NOT SUFFICIENT.

Statement 2, however, does help us, if we make the triangle  $OAB$  as shown below and draw a perpendicular  $OP$  onto  $AB$ .



The perpendicular from the centre of the circle to any chord always bisects the chord. Thus, we can find out the length of  $OP$  using the Pythagoras theorem.  $OAB$  is an isosceles triangle so the 3 angles will be in the same ratio as the 3 sides. Using this, we can calculate  $\angle OAB$ . We can then calculate the area of the major arc  $AB$  and add the area of the triangle to this figure to get a Grand total. When we subtract this Grand total from the area of the entire circle, we will get the area of minor arc segment  $AB$ . Thus statement 2 is SUFFICIENT.

**The correct answer is B.**

Note that we did not actually do any calculations above. You must use this approach while attempting Data Sufficiency questions so as to save time.

15. The average monthly income of Anil and Hemant is Rs 4,025. The average monthly income of Hemant and Chandan is Rs 6,250. The average monthly income of Anil and Chandan is Rs 5,200. What is Hemant's monthly income?

- (A) Rs 4,590  
(B) Rs 5,075  
(C) Rs 5,950  
(D) Rs 6,075  
(E) Rs 6,950

$$\text{Anil} + \text{Hemant} = 8050$$

$$\text{Therefore, Hemant} = 8050 - \text{Anil}$$

$$\text{Hemant} + \text{Chandan} = 12500$$

$$\text{Therefore, Hemant} = 12500 - \text{Chandan}$$

$$8050 - \text{Anil} = 12500 - \text{Chandan}$$

$$\text{Or, Chandan} - \text{Anil} = 12500 - 8050 = 4450 \quad \dots \text{i}$$

$$\text{And, Chandan} + \text{Anil} = 10400 \quad \dots \text{ii}$$

Adding equations i and ii

$$2 \text{ Chandan} = 14850$$

$$\begin{aligned}\text{Therefore, Chandan} &= 7425 \\ \text{Hemant} &= 12500 - \text{Chandan} \\ &= 12500 - 7425 \\ &= 5075\end{aligned}$$

The correct answer is B.

16. Which of the following is a perfect square?

- (A) 97,474  
(B) 1,23,301  
(C) 1,37,641  
(D) 1,70,567  
(E) 1,77,243

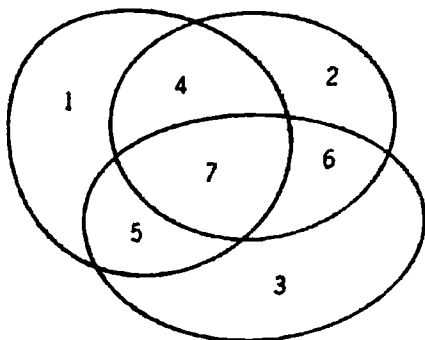
We need to find the square root of all the given numbers.

Only option (C) has an integral square root as 371, that is,  $\sqrt{1,37,641} = 371$ . For the other option we won't get an integer as square root.

The correct answer is C.

17. In a locality of 40 houses, each house is subscribed to at least one newspaper from amongst, The Sun, Daily Mail and Daily Mirror. 24 houses subscribe to Daily Mirror. 13 houses subscribe to both The Sun and Daily Mirror. 26 houses subscribe to Daily Mail out of which 16 also subscribe to The Sun. There is no house which subscribes to The Sun alone. 7 houses subscribe to all three newspapers. How many houses subscribe to only two newspapers?

- (A) 12  
(B) 14  
(C) 16  
(D) 18  
(E) 20



Here the situation can be shown as per the above Venn diagram. We have 3 sets, each representing the houses receiving The Sun, Daily mail and Daily mirror, respectively. The total area can be divided into 7 parts which are marked:

- 1 = houses which receive only The Sun  
2 = houses which receive only Daily Mail

- 3 = houses which receive only Daily Mirror  
4 = houses which receive only The Sun and Daily Mail  
5 = houses which receive only The Sun and Daily Mirror  
6 = houses which receive only Daily Mail and Daily Mirror  
7 = houses which receive all 3

$$\begin{aligned}\text{We are given } n(1 + 2 + 3 + 4 + 5 + 6 + 7) &= 40, n(3 \\ + 5 + 6 + 7) &= 24, n(5 + 7) = 13, n(2 + 4 + 6 + 7) = 26, n(4 + 7) = 16\end{aligned}$$

$$n(1) = 0 \text{ and } n(7) = 7$$

$$\text{So, we have } n(5) = n(5 + 7) - n(7) = 6 \text{ and } n(4) = 9.$$

We need to find the number of people receiving exactly 2 newspapers, that is,  $n(4 + 5 + 6) = n(4) + n(5) + n(6)$

$$\text{We have } n(2 + 6) = 10 \text{ and } n(6 + 3) = 11.$$

$$n(1 + 2 + 3 + 4 + 5 + 6 + 7) = 40, n(1) = 0, n(4) = 9, n(5) = 6 \text{ and } n(7) = 7$$

$$\text{So, } n(2 + 3 + 6) = 40 - 9 - 6 - 7 = 18$$

$$\text{Also, } n(2 + 3 + 6) = n(2 + 6) + n(3 + 6) - n(6)$$

$$\text{So, } n(6) = 10 + 11 - 18 = 3$$

$$\text{So, the number of houses receiving exactly 2 newspapers is } = n(4) + n(5) + n(6) = 9 + 6 + 3 = 18$$

The correct answer is D.

18. Four clocks were set right at the same time. One clock gains 'a' minutes in a day, second clock loses 'b' minutes in a day, third clock gains 'c' minutes in a day and the fourth clock gains 'd' minutes. After how much time will all the clocks again show the correct time simultaneously if  $a + b + c + d = 1$  hour,  $a : b : c : d = 2 : 1$  and  $b : d = 3 : 1$ ?

- (A) 3 hours  
(B) 12 hours  
(C) 24 hours  
(D) 24 days  
(E) 144 days

$$a : b : c : d = 2$$

$$a = 2b$$

$$c = 2d$$

$$\text{now } a + b + c + d = 1 \text{ hour}$$

$$2b + b + 2d + d = 1 \text{ hour}$$

$$b + d = 20 \text{ minutes}$$

$$\text{now } b : d = 3$$

$$b = 3d$$

$$b + d = 20 \text{ minutes}$$

$$3d + d = 20$$

$$d = 5$$

$$\text{Now } C = 2d = 2(5) = 10$$

$$a + b + 10 + 5 = 1 \text{ hour}$$

$$a + b = 45 \text{ minutes}$$

$$2b + b = 45$$

$$a = 15$$

$$a = 2(15) = 30$$

When a clock gains 12 hours or loses 12 hours then it shows the correct time

First clock gains 30 minutes in a day means  
12 hours gain in 24 days

Second clock loses 15 minutes in a day means  
12 hours loss in 48 days

Third clock gains 10 minutes in a day means  
12 hours gain in 72 days

Fourth clock loses 5 minutes in a day means  
12 hours losses in 144 days

So,

First clock shows the correct time after every  
24 days, that is, 24 days, 48 days, 72 days,...

Second clock shows the correct time after every  
48 days, that is, 48 days, 96 days, 144 days,...

Third clock shows the correct time after every  
72 days, that is, 72 days, 144 days,...

Fourth clock shows the correct time after every  
144 days, that is, 144 days, 288 days,...

Thus, all three clocks show the correct time after  
L.C.M. (24, 48, 72, 144) = 144 days

**The correct answer is E.**

**Directions for Questions 19–22:** Go through the given table and solve the question based on it.

	Production of Major Crops (tonnes)				
	Y1	Y2	Y3	Y4	Y5
Foodgrain (Kharif)	69	78	99	102	111
Foodgrain (Total)	108	130	176	197	217
Cereals (Kharif)	65	74	94	98	106
Cereals (Total)	97	119	162	186	203
Pulses (Kharif)	4	4	5	4	5
Pulses (Total)	12	11	14	11	14
Rice (Kharif)	40	50	66	73	80
Rice (Total)	42	54	74	85	93
Oilseeds (Kharif)	7	5	10	12	14
Oilseeds (Total)	10	9	19	18	24

Total foodgrain production = production of rabi foodgrain + production of kharif foodgrain

It would be a good idea to make the table once again with the rabi figures included in it as below:

	Y1	Y2	Y3	Y4	Y5
Foodgrain (K)	69	78	99	102	111
Foodgrain (R)	39	52	77	95	106
Foodgrain (Total)	108	130	176	197	217
Cereals (K)	65	74	94	98	106
Cereals (R)	32	45	68	88	97
Cereals (Total)	97	119	162	186	203
Pulses (K)	4	4	5	4	5
Pulses (R)	8	7	9	7	9
Pulses (Total)	12	11	14	11	14
Rice (K)	40	50	66	73	80
Rice (R)	2	4	8	12	13
Rice (Total)	42	54	74	85	93
Oilseeds (K)	7	5	10	12	14
Oilseeds (R)	3	4	9	6	10
Oilseeds (Total)	10	9	19	18	24

The questions can now be answered using the above table.

19. In which year did the production of rabi foodgrains exhibit the highest percentage increase over the preceding year?

- (A) Y1  
(B) Y2  
(C) Y3  
(D) Y4  
(E) Y5

Let's calculate the total rabi production in each year using the table we have made earlier:

Total rabi production in Y1 = 84

Total rabi production in Y2 = 112

Total rabi production in Y3 = 171

Total rabi production in Y4 = 208

Total rabi production in Y5 = 235

While you can calculate the actual percentage increase for each year, by observation this will clearly be in Y3. Calculating the actual percentages will take too much time. This should be avoided.

**The correct answer is C.**

20. From Y2 to Y5, for which crop was the percentage increase in the rabi crop production the highest?

- (A) Rice  
(B) Pulses  
(C) Cereals

- (D) Oilseeds  
(E) Foodgrain

Again, do not try to actually calculate. For foodgrains and cereals, the production has approximately doubled from Y2 to Y5. For pulses it is much less, so pulses are out of consideration. For oilseeds it's 2.5 times, whereas for rice it is more than 3 times. Thus, the percentage increase has to be the highest for rice.

The correct answer is A.

21. What was the average production of rabi cereals from Y1 to Y5?

- (A) 20 tonnes  
(B) 32 tonnes  
(C) 45 tonnes  
(D) 54 tonnes  
(E) 66 tonnes

$$\begin{aligned}\text{Required average} &= (32 + 45 + 68 + 88 + 97)/5 \\ &= 330/5 = 66\end{aligned}$$

The correct answer is E.

22. From Y3 to Y4, what was the percentage increase in the total rabi production of the five major crops?

- (A) 21.64%  
(B) 42.45%  
(C) 48.82%  
(D) 52.56%  
(E) 58.34%

$$\text{Total rabi production in Y3} = 171$$

$$\text{Total rabi production in Y4} = 208$$

$$\begin{aligned}\text{Therefore, percentage increase} &= (208 - 171)/171 \\ &\times 100 \\ &= 21.64\%\end{aligned}$$

The correct answer is A.

23. If  $\log_{10}2 = 0.3010$ , what is the value of  $\log_5 256$ ?

- (A) 3.11  
(B) 3.26  
(C) 3.44  
(D) 3.67  
(E) 3.82

$$\log_{10}2 = 0.3010 \text{ and also } \log_{10}10 = 1$$

$$\text{So, } \log_{10}(2 \times 5) = 1$$

$$\log_{10}2 + \log_{10}5 = 1 \text{ and so } \log_{10}5 = 0.6990$$

$$\begin{aligned}\text{Now, } \log_5 256 &= \log_{10}256 / \log_{10}5 = \log_{10}28 / \log_{10}5 = \\ &= 8 \log_{10}2 / \log_{10}5 = 8 \times 0.3010 / 0.6990 = 3.44\end{aligned}$$

The correct answer is C.

24. The 5<sup>th</sup> and 9<sup>th</sup> terms of a harmonic progression are  $\frac{2}{3}$  and  $\frac{2}{9}$  respectively. What is the first term of the progression?

- (A) -3.5  
(B) -1.5  
(C) -0.67  
(D) 0  
(E) 1.5

As, the terms are in H.P. so, their inverse must be in A.P. (Arithmetic progression)

So,  $3/2$  and  $9/2$  are the 5<sup>th</sup> and 9<sup>th</sup> terms of the A.P. and we know if  $a$  and  $d$  are 1<sup>st</sup> term and common difference of A.P., then, 9<sup>th</sup> term - 5<sup>th</sup> term =  $4d$

$$= 9/2 - 3/2$$

$$\text{So, } d = 3/4$$

$$\begin{aligned}\text{Now, the 1<sup>st</sup> term of A.P.} &= 5^{\text{th}} \text{ term} - 4d \\ &= 3/2 - 4(3/4) = -3/2\end{aligned}$$

Hence, the 1<sup>st</sup> term of H.P. must be the inverse of 1<sup>st</sup> term of A.P. and so, the 1<sup>st</sup> term of H.P. is

$$1/(-3/2) = -2/3 = -0.67$$

The correct answer is C.

25. Sanya, Babli and Jhanvi started a new business. Sanya's capital was invested for a period which was equal to four times Jhanvi's period of investment whereas Sanya and Babli invested for the same period. Also, twice Sanya's investment is equal to Jhanvi's investment, and Babli's investment is equal to  $\frac{1}{2}$  of Sanya's investment. If the total year-end profit from this business yielded Rs 4,40,000, then what was the total share of Sanya and Babli in this profit?

- (A) Rs 2,40,000  
(B) Rs 2,50,000  
(C) Rs 2,55,000  
(D) Rs 2,60,000  
(E) Rs 3,30,000

Let's assume Sanya and Babli invested for 12 months

Therefore, Jhanvi invested for  $12/4 = 3$  months

Let Sanya's investment be 100

Therefore, Jhanvi's investment =  $100 \times 2 = 200$

And, Babli's investment =  $0.5 \times 100 = 50$

Therefore, their total contribution is:



$$\text{Sanya} = 100 \times 12 = 1200$$

$$\text{Jhanvi} = 200 \times 3 = 600$$

$$\text{Babli} = 50 \times 12 = 600$$

Thus, the ratio of Sanya : Jhanvi : Babli = 1200 : 600 : 600

$$= 2 : 1 : 1$$

Therefore, the share of Sanya and Babli in profit =  $\frac{3}{4} \times 440000$

$$= 330000$$

The correct answer is E.

26. On January 1, Ajit put Re 1 in his piggy bank. Every day, he put in Rs 2 more than the total amount of money already in the piggy bank. Which of the following expressions gives the total amount of money in Ajit's piggy bank at the end of January?

- (A)  $2^{30}$   
 (B)  $2^{31}$   
 (C)  $3(2^{30}) - 2$   
 (D)  $3(2^{31}) - 2$   
 (E)  $3(2^{30})$

Ajit puts Re 1 on January 1, Rs 3 on January 2, Rs 6 on January 3, Rs 12 on January 4 and so on.

So, the series is  $1 + 3 + 6 + 12 + 24 + \dots$

The 2<sup>nd</sup> to 31<sup>st</sup> term are in G.P. with 1<sup>st</sup> term 3 and common ratio = 2

So, the total money in Ajit's piggy bank at the end of January is sum of series  $1 + 3 + 6 + 12 + 24 + \dots$

$= 1 + \text{sum of 30 terms of G.P. with 1<sup>st</sup> term and common ratio 3 and 2 respectively}$

$= 1 + a(r^n - 1)/(r - 1)$  (where  $a = 3$ ;  $r = 2$  and  $n = 30$ )

So, amount at the end of January is

$$= 1 + 3(2^{30} - 1)/(2 - 1)$$

$$= 1 + 3(2^{30} - 1)$$

$$= 1 + 3(2^{30}) - 3$$

$$= 3(2^{30}) - 2$$

The correct answer is C.

27. A person purchased a smartphone for Rs 8,000 and sold it at a profit of 25%. From that amount, he purchased another phone and sold it at a loss of 20%. What is his overall profit or loss?

- (A) profit of Rs 2,000  
 (B) profit of Rs 1,000  
 (C) loss of Rs 2,000  
 (D) loss of Rs 1,000  
 (E) neither profit nor loss

$$\begin{aligned} \text{Selling price of smartphone} &= 8000 \times 1.25 \\ &= 10000 \end{aligned}$$

$$\text{CP of 2<sup>nd</sup> phone} = 10000$$

$$\text{SP of 2<sup>nd</sup> phone} = 10000 \times 0.8 = 8000$$

Hence, overall the person made no profit or loss.

The correct answer is E.

28. Harsh alone can complete  $\frac{2}{3}$  of a coding project in 6 days. Sumit alone can complete  $\frac{1}{3}$  of the same project in 8 days and Mini can complete  $\frac{3}{4}$  of the same work in 12 days. All of them started coding together. After 4 days, Harsh and Mini left the project. How many more days will be required by Sumit to complete the project?

- (A) 2.33 days  
 (B) 2.67 days  
 (C) 3.33 days  
 (D) 3.67 days  
 (E) 4.33 days

Harsh can complete the entire project in  $6 \times \frac{3}{2} = 9$  days

Sumit can complete the entire project in  $8 \times \frac{3}{1} = 24$  days

Mini can complete the entire project in  $12 \times \frac{4}{3} = 16$  days

Total work done by all 3 in one day =  $\frac{1}{9} + \frac{1}{24} + \frac{1}{16} = \frac{31}{144}$

Therefore, total work done by all 3 in 4 days =  $\frac{31}{144} \times 4 = \frac{31}{36}$

Therefore, work remaining =  $1 - \frac{31}{36} = \frac{5}{36}$

Time taken by Sumit to complete  $\frac{5}{36}$  of the work =  $\frac{5}{36} \times 24 = 3.33$  days

The correct answer is C.

29. Using the digits 1, 2, 3 and 4, some two digit numbers can be formed. The sum of these numbers is AA0. AA is:

- (A) 11  
 (B) 22  
 (C) 33  
 (D) 44  
 (E) 55

The numbers are 11, 12, 13, 14, 21, 22, 23, 24, 31, 32, 33, 34, 41, 42, 43, 44

Sum of numbers = 440

Thus AA = 44

The correct answer is D.

Directions for Questions 30–33: Go through the given information and solve the question based on it.

Stock 1, Stock 2 and Stock 3 are stocks of small cap companies and Stock 4 is the stocks of a mid cap company. For each investor, mid cap stocks are given greater weightage than small cap stocks and all the small cap stocks have the same weightage. The weightage is different for each investor.

Stocks					
Investor	Stock 1	Stock 2	Stock 3	Stock 4	Total
Paul	6,500	7,500	7,000	5,000	36,000
Bindu	7,300		6,700	6,300	
Arhan	6,600	7,300	6,900		
Sheela	4,800			8,900	39,500
Thomas	5,600	3,200	1,200	8,400	

30. Which of the following can be the ratio of the weightage of Stock 4 to the weightage of Stock 2 that Paul holds?

(A) 1 : 4  
(B) 1 : 3  
(C) 1 : 2  
(D) 3 : 1  
(E) 4 : 1

Let the ratio of mid cap to small cap for Paul be  $x : y$ .

Now all small cap stocks have same weightage,

So, the value of Paul's portfolio must be  $x(\text{stock 4}) + y(\text{stock 1} + \text{stock 2} + \text{stock 3})$

So,  $36,000 = x(5,000) + y(6,500 + 7,500 + 7,000)$

$36,000 = x(5,000) + y(21,000)$

Now,  $x > y$  (as weightage of mid cap is more than small cap stocks)

If we check values, then only option D and E have  $x > y$ . So, we check only D and E

Using option D,  $x = 3$  and  $y = 1$  gives the correct value of portfolio

The correct answer is D.

31. If the ratio of the weightage of small cap stocks to that of mid cap stocks is 1 : N (where N is any integer), what can be the maximum value of Stock 3 that Sheela holds?

(A) Rs 8,000  
(B) Rs 8,450

(C) Rs 16,900

(D) Rs 19,000

(E) Rs 27,600

Let value of stock 3 which Sheela holds be  $x$

So, value of her portfolio is  $1(4,800 + x) + N(8,900)$

The value of her portfolio is 39,500

So, we have  $1(4,800 + x) + N(8,900) = 39,500$

For,  $x$  to be maximum,  $N$  must be minimum and we know weightage of mid cap stock must be more than that of small cap.

So,  $N > 1$ .

Also, given  $N$  must be an integer. The smallest integer  $> 1$  is 2 and hence for  $x$  to be maximum,  $N = 2$

So, we have  $1(4,800 + x) + 2(8,900) = 39,500$

Solving it we get,  $x = \text{Rs. } 16,900$

The correct answer is C.

32. If the sum of the values of Stock 1 and Stock 3 that Bindu holds is the same as the value of Stock 4 that she holds, what is the ratio of the weightage of her small cap stocks to the weightage of her mid cap stocks?

(A) 1 : 7  
(B) 2 : 9  
(C) 4 : 15  
(D) 7 : 20  
(E) 9 : 20

Let the weightage of small to mid cap stocks for Bindu be  $x : y$  where  $y > x$

So, sum of value of stock 1 and 3 is  $x(7,300 + 6,700)$

Value of mid cap stock 4 is  $y(6,300)$

As, value of small cap and mid cap stocks is same

Hence,  $x(7,300 + 6,700) = y(6,300)$

$14,000x = 6,300y$

Therefore,  $x : y = 6,300 : 14,000 = 63 : 140 = 9 : 20$

The correct answer is E.

33. In Thomas's portfolio, the value of Stock 3 is one-eighth of the value of Stock 4. What is the ratio of the weightage of a small cap stock to the weightage of a mid cap stock that Thomas holds?

(A) 3 : 4  
(B) 7 : 9  
(C) 7 : 8

(D) 8 : 9

(E) 9 : 8

Let the ratio of small cap to mid cap for Thomas be  $x : y$  ( $y > x$ )

Total value of stock 3 =  $x(1200)$

Total value of stock 4 =  $y(8,400)$

It is given,  $x(1200) = 1/8 y(8,400)$

So,  $x : y = 8,400/(8 \times 1200) = 7 : 8$

**The correct answer is C.**

34. How many 5 digit numbers can be formed using the digits 1, 2, 3, 4, 5 and 6 (without repetition) that are divisible by 8?

(A) 56

(B) 64

(C) 72

(D) 84

(E) 96

Any number is divisible by 8 if its last 3 digits are divisible by 8.

So, we have to make total possible 5 digit numbers so that last 3 digits are divisible by 8 using the digits 1, 2, 3, 4, 5 and 6 and without repetition.

So, we must first fix the last 3 digits and only then can the other digits be fixed.

**Case 1** 3<sup>rd</sup> digit is 1

- (a) If 4<sup>th</sup> digit is 2 then we have only 120 and 128 divisible by 8 but, these can't be used.
- (b) If 4<sup>th</sup> digit is 3 then there is only 1 possibility of 136—these are such 6 possible numbers (as we have  $3 \times 2 \times 1 \times 1 \times 1$  such possible numbers).
- (c) If 4<sup>th</sup> digit is 4—we can't find the number which is divisible by 8.
- (d) If 4<sup>th</sup> digit is 5 then 152 is only possible number divisible by 8—we again have such 6 numbers (again  $3 \times 2 \times 1 \times 1 \times 1$ ).
- (e) If 4<sup>th</sup> digit is 6—we can't have such a number which is divisible by 8.

**Case 2** 3<sup>rd</sup> digit is 2

- (a) If 4<sup>th</sup> digit is 1 then we have only 216 and so such 6 numbers are possible.
- (b) If 4<sup>th</sup> digit is 3 then there is no such number.
- (c) If 4<sup>th</sup> digit is 4—we can't find the number which is divisible by 8.
- (d) If 4<sup>th</sup> digit is 5 then 256 is the only possible number divisible by 8—we again have such 6 numbers (again  $3 \times 2 \times 1 \times 1 \times 1$ ).

- (e) If 4<sup>th</sup> digit is 6—we have 264 divisible by 8 and again such 6 numbers are possible.

**Case 3** 3<sup>rd</sup> digit is 3

- (a) If the 4<sup>th</sup> digit is 1 then we have only 312 and so such 6 numbers are possible.
- (b) If the 4<sup>th</sup> digit is 2 then there is no such number.
- (c) If the 4<sup>th</sup> digit is 4—we can't find the number which is divisible by 8.
- (d) If 4<sup>th</sup> digit is 5 then 352 is only possible number divisible by 8—we again have such 6 numbers (again  $3 \times 2 \times 1 \times 1 \times 1$ ).
- (e) If the 4<sup>th</sup> digit is 6—no such number is possible.

**Case 4** 3<sup>rd</sup> digit is 4

- (a) If the 4<sup>th</sup> digit is 1 then we have only 416 and so such 6 numbers are possible.
- (b) If the 4<sup>th</sup> digit is 2 then no such number is possible.
- (c) If the 4<sup>th</sup> digit is 3 then we have 432 and such 6 numbers are possible.
- (d) If the 4<sup>th</sup> digit is 5 then 456 is the only possible number divisible by 8—we again have such 6 numbers (again  $3 \times 2 \times 1 \times 1 \times 1$ ).
- (e) If the 4<sup>th</sup> digit is 6—no such number is possible.

**Case 5** 3<sup>rd</sup> digit is 5

- (a) If the 4<sup>th</sup> digit is 1 then we have only 512 and so such 6 numbers are possible.
- (b) If the 4<sup>th</sup> digit is 2 then there is no such number.
- (c) If the 4<sup>th</sup> digit is 3—536 and so such 6 numbers are possible.
- (d) If the 4<sup>th</sup> digit is 4—no such number is possible.
- (e) If the 4<sup>th</sup> digit is 6—no such number is possible.

**Case 6** 3<sup>rd</sup> digit is 6

- (a) If the 4<sup>th</sup> digit is 1 then no such number is possible.
- (b) If the 4<sup>th</sup> digit is 2 then 624 is possible and so 6 numbers can be formed.
- (c) If the 4<sup>th</sup> digit is 3 then we have 632 and such 6 numbers are possible.
- (d) If the 4<sup>th</sup> digit is 4 then no such number can be formed.
- (e) If the 4<sup>th</sup> digit is 6—no such number is possible.

Total such possible numbers are  $12 + 18 + 12 + 18 + 12 + 12 = 84$

**The correct answer is D.**

35. **Directions:** This problem consists of a question and two statements, labelled (1) and (2), in which certain data are given. You have to decide whether the data given in the statements are sufficient for answering

the question. Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

If  $a^b$  is such that  $a$  and  $b$  both are integers, then is  $b$  a multiple of 6?

- (1)  $a^b$  is a perfect square.
- (2)  $a^b$  is a perfect cube.
- (A) Statement (1) ALONE is sufficient, but statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) ALONE is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

Individually the statements don't give us any information as to whether  $b$  is a multiple of 6 so NOT SUFFICIENT.

Combining the two statements, for any number to be a perfect square and a perfect cube, the power has to be 6 or some multiple of 6. For example,  $2^6 = 64$  and  $64$  is a perfect square ( $8^2$ ) and a perfect cube ( $4^3$ ). Thus, both the statements together are SUFFICIENT.

The correct answer is C.

36. What is the minimum value of

$$\left( x^{2401} + \frac{1}{x^{2401}} + 2 \times x^{2401} \times \frac{1}{x^{2401}} \right)^{1/2}, \text{ where } x > 0?$$

- (A) 2
- (B) 4
- (C) 16
- (D) 49
- (E) It cannot be determined.

Let  $x^{2401}$  be  $a$ .

We have to minimise  $(a + 1/a + 2 \times a \times 1/a)^{1/2} = (a + 1/a + 2)^{1/2}$

For  $a$  and  $1/a$  we have A.M. (arithmetic mean) =  $(a + 1/a)/2$

G.M. (geometric mean) =  $(a \times 1/a)^{1/2} = 1$

As, we know A.M.  $\geq$  G.M.

So,  $(a + 1/a)/2 \geq (a \times 1/a)^{1/2}$

So,  $(a + 1/a) \geq 2$

Its minimum possible value is 2 (for A.M. = G.M.)

So, minimum possible value of  $(a + 1/a + 2 \times a \times 1/a)^{1/2} = (2 + 2)^{1/2} = 2$

The correct answer is A.

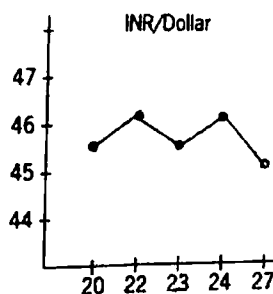
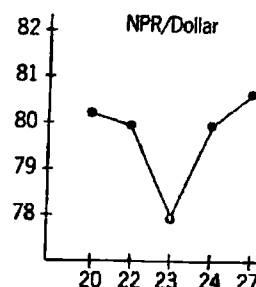
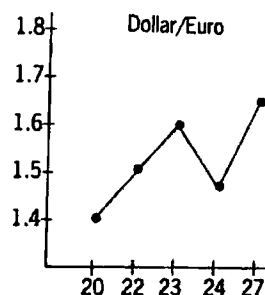
37. Find the sum of the interior angles of a nine-sided regular polygon.

- (A)  $20^\circ$
- (B)  $360^\circ$
- (C)  $810^\circ$
- (D)  $1260^\circ$
- (E)  $1620^\circ$

$$\begin{aligned} \text{Sum of interior angles of a polygon} &= 180(n - 2) \\ &= 180(9 - 2) \\ &= 180 \times 7 \\ &= 1260^\circ \end{aligned}$$

The correct answer is D.

Directions for Questions 38–41: Use the graph, which refers to the currency ratio of 20<sup>th</sup> June to 27<sup>th</sup> June 2008, to answer the following questions.



38. On 22<sup>nd</sup> June, how much NPR would be equal to the value of INR 4,000?

- (A) 6,596
- (B) 6,956
- (C) 9,656
- (D) 9,665
- (E) None of these

On 22<sup>nd</sup> June INR 46 = 1 dollar

Therefore, INR 4000 =  $4000/46 = 87$  dollar approx.

Now, on 22<sup>nd</sup> June, 1 dollar = 80

Therefore, 87 dollar =  $87 \times 80 = 6960$  NPR

Option B comes closest to this and should be the correct answer.

**The correct answer is B.**

39. If the NPR/Dollar ratio follows the same trend from 27<sup>th</sup> to 30<sup>th</sup> as from 24<sup>th</sup> to 27<sup>th</sup>, what will be the value of 150 Dollars on 30<sup>th</sup> June?

(A) 11,250  
(B) 11,520  
(C) 12,150  
(D) 12,510  
(E) None of these

If the NPR/dollar ratio follows the same trend, on 30<sup>th</sup> July 1 dollar = 82 NPR (the actual number will be slightly lower than 82 but let's take 82 as it would make calculations easier)

Therefore, 150 dollars =  $150 \times 82 = 12300$  NPR

Since the actual number should have been slightly lower than 82, we should choose the option slightly lower than 12300.

**The correct answer is C.**

40. A bike costs \$1,000. Aman has INR 45,500, Euro 600 and 77,000 NPR with him. He would be able to buy the bike on 23<sup>rd</sup> June using (assume that he can use only one type of currency for the transaction):

(A) EUR 600  
(B) INR 45,500  
(C) NPR 75,000  
(D) NPR 80,000  
(E) None of the above

For 23<sup>rd</sup> June  $1\$ = \text{INR } 45.5$  and so  $1000\$ = \text{INR } 45,500$ . So, Aman can buy the bike using INR 45,500

For 23<sup>rd</sup> June 1 Euro = \$1.6 and so 600 Euro =  $\$(600 \times 1.6) = \$960$ . It is \$40 less than the cost of the bike. So, Aman can't buy the bike using Euro 600

For 23<sup>rd</sup> June  $1\$ = \text{NPR } 78$  and so  $77,000 \text{ NPR} = \$(77,000/78)$  which is again less than \$1,000. So, Aman can't buy the bike using 77,000 NPR

**The correct answer is B.**

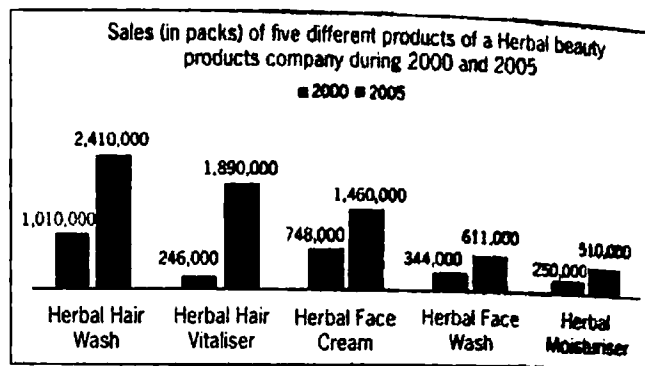
41. On 18<sup>th</sup> June, the INR/Dollar ratio was 43.5. On that day INR 6,000 would be equal to:

(A) 4,285 Euro  
(B) 4,582 Euro  
(C) 4,825 Euro  
(D) 5,205 Euro  
(E) Cannot be determined

We cannot arrive at the answer since all the answer choices are given in Euro and we do not know the INR/Euro or Dollar/Euro ratio on June 18<sup>th</sup>.

**The correct answer is E.**

**Directions for Questions 42–45:** Go through the given graph and solve the questions based on it. This chart indicates the sales of Herbal Beauty Products Company during a period of time.



42. What is the ratio of percentage growth in sales of Herbal Hair Wash and Herbal Hair Vitaliser during 2000–2005 (rounded off to the nearest integer)?

(A) 1 : 4  
(B) 1 : 5  
(C) 5 : 4  
(D) 4 : 1  
(E) 7 : 8

Percentage growth in sales of herbal hair wash =  $(2410000 - 1010000)/1010000 \times 100 = 138.6\%$

Percentage growth in sales of herbal hair vitaliser =  $(1890000 - 246000)/246000 \times 100 = 668.2\%$

Therefore, required ratio =  $138/668 = 1 : 5$  approx

**The correct answer is B.**

43. What is the percentage growth in overall sales (in terms of packs) of Herbal Beauty products in 2000 compared to 2005?

(A) 104.3%  
(B) 138.6%  
(C) 164.8%  
(D) 171.3%  
(E) 183.6%

Total sales of Herbal Beauty product in 2000 =  $1010000 + 246000 + 748000 + 344000 + 250000 = 2598000$

Total sales of Herbal Beauty product in 2005 =  
 $2410000 + 1890000 + 1460000 + 611000 + 510000$

$$= 6881000$$

Therefore, percentage growth =  
 $(6881000 - 2598000) / 2598000 \times 100$   
 $= 164.8\%$

The correct answer is C.

44. For which product did the sales increase by almost 78% from 2000–2005?

- (A) Herbal Moisturiser
- (B) Herbal Face Wash
- (C) Herbal Face Cream
- (D) Herbal Hair Wash
- (E) Herbal Hair Vitaliser

By observation, we can eliminate Hair wash, Hair Vitaliser and Moisturiser because in all three the sales have more than doubled from 2000 to 2005, that is, an increase of more than 100%.

For face cream and face wash, we can calculate the percentage increase:

$$\text{Face cream} = (1460000 - 748000) / 748000 \times 100$$

$$= 95.1\%$$

Since face cream is incorrect, the answer has to be face wash, so you don't necessarily have to calculate it.

However, if we do calculate, % increase for face wash =  $(611000 - 344000) / 344000 \times 100 = 77.6\%$   
 $= 78\%$  approx.

The correct answer is B.

45. What is the approximate ratio of the percentage growth in sales of Herbal Hair Vitaliser to the percentage growth of the rest of the products in the period 2000–05?

- (A) 5 : 3
- (B) 5 : 2
- (C) 7 : 2
- (D) 6 : 1
- (E) 9 : 1

Percentage growth in sales of Herbal Hair Vitaliser = 668.2% (already calculated in Q1)

$$\text{Percentage growth in sales of the rest of the products} = (4991000 - 2352000) / 2352000 \times 100$$

$$= 112.2\%$$

Thus, required ratio = 668/112

$$= 6 : 1 \text{ approx}$$

The correct answer is D.

Directions for Questions 46–48: A question is followed by two statements, numbered (1) and (2). Using the information provided and general knowledge, decide whether the information given is sufficient to solve the problem.

46. What is the area of the quadrilateral?

- (1) The co-ordinates of the vertices are (1, 5), (2, 3), (5, 4) and (4, 7).
- (2) The intersection of its diagonals is at the origin.
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

Using statement 1 alone—as coordinates of all the vertices are given, so each side and both diagonals can be obtained and using them, area of quadrilateral can be obtained (by considering it as 2 triangles and for each triangle 2 sides are adjacent sides of quadrilateral and 3<sup>rd</sup> side for both is the same diagonal). Therefore, statement 1 alone is sufficient.

Using statement 2 alone—the given information is inadequate to find the area of the quadrilateral

The correct answer is A.

47. A circular park has an iron railing surrounding it. The length of the fence that surrounds circular garden M is 1/3 the length of the fence that surrounds circular garden N. What is the area of circular garden N? (Assume that the fence has negligible width.)

- (1) The area of M is  $64\pi$  square meters.
- (2) The diameter of M is 1/3 that of N.
- (A) Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
- (B) Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
- (C) BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.
- (E) Statements (1) and (2) TOGETHER are NOT sufficient.

From statement 1, we can calculate the radius of M. From this we can get the circumference of

M, which will give us the circumference of N. The circumference of N will give us the radius of N, which in turn will give us the area of N. So, SUFFICIENT  
Statement 2 does not help because we haven't been given an actual figure for the diameter to work with. So, NOT SUFFICIENT

**The correct answer is A.**

48. The two brothers bought 4 items of antique artefacts to decorate their showroom. However, on persistent requests from customers, both brothers each sold two pieces. Whose transaction resulted in a better profit?

- (1) Ramu sold one item at  $p\%$  profit and the other at  $p\%$  loss though he had bought both items at the same price.
- (2) Somu made  $q\%$  profit on one item and on the other  $q\%$  loss though he sold both items at the same price.
- (A) Statement (1) ALONE is sufficient, but Statement (2) ALONE is not sufficient.
- (B) Statement (2) ALONE is sufficient, but Statement (1) ALONE is not sufficient.
- (C) BOTH statements (1) and (2) TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
- (D) EACH statement ALONE is sufficient.

- (E) Statements (1) and (2) TOGETHER are NOT sufficient, and additional data is needed.

Statement 1 tells us that Ramu sold his items for no profit no loss. But, we do not know anything about Somu. So, NOT SUFFICIENT

Statement 2 tells us that Somu sold his items for a slight loss. To understand this, tick any number as the selling price for each of Somu's items. Let's say, Somu sold each item for Rs. 100 and let  $q = 10\%$

Then, Somu's total SP = 200

CP for 1 item sold at 10% profit = 91 approx

CP for 2<sup>nd</sup> item sold at 10% loss = 111 approx

Thus total CP =  $91 + 111 = 202$

Thus loss =  $202 - 200 = 2$

Note that statement 2 still does not tell us anything about Ramu. Hence, NOT SUFFICIENT

However, by combining the two statements, we can conclude that Ramu's deal was better. Hence, SUFFICIENT

**The correct answer is C.**

# Logical Reasoning

1. Directions: In the given question, there are five choices (A-E). Four of them are alike and one is different. Mark the one that is different.

(A) cat  
(B) horse  
(C) camel  
(D) bullock  
(E) donkey

Horse, camel, bullock and donkey are all used by humans for different purposes but a cat is not used by humans for any purpose. Hence, it is the odd one out.

The correct answer is A.

2. Directions: A statement is given followed by two assumptions numbered I and II. An assumption is something supposed or taken for granted. Consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement.

Statement:

Mohan requested that his mother arrange food for about 30 persons as he had invited all his friends to celebrate his birthday.

Assumptions:

- I. Most of Mohan's friends may come to his house on his birthday.  
II. There may be more than 30 friends who may attend Mohan's birthday party.  
(A) Only Assumption I is implicit.  
(B) Only Assumption II is implicit.  
(C) Both I and II are implicit.  
(D) Either I or II is implicit.  
(E) Neither I nor II is implicit.

Mohan has requested his mother to arrange food for 30 people and he has also invited all his friends. Then, it is definitely implicit that he expects most of his friends to turn up. Thus, Assumption I is implicit. There is nothing in the statement implying that more than 30 people may attend Mohan's birthday party. If that were the case, Mohan would have requested his mother to arrange food for more people but he did not do so. Thus, Assumption II is not implicit.

The correct answer is A.

3. In a certain code language, if CHAIR is coded as DIBJS, how is the word TABLE coded in that same language?

(A) UBCMF  
(B) UBCMG  
(C) UBDMF  
(D) UBCNF  
(E) UBCLF

Each letter of the original word is replaced by the letter that comes immediately after it in the English alphabet. Thus, C becomes D, H becomes I, and so on.

By the same logic, the code for TABLE should be UBCMF.

The correct answer is A.

4. Pointing towards a person, Sita told her son that the person was the only son of his maternal grandmother. Who is that person to Sita's husband?

(A) Father-in-law  
(B) Brother-in-law  
(C) Brother  
(D) Father  
(E) Uncle

The maternal grandmother has to be Sita's mother, which makes the person Sita's brother. Thus, he will be Sita's husband's brother-in-law.

The correct answer is B.

5. In a certain number system, there are only 5 numerals - 0, 1, 2, 3 and 4, which are represented by @, #, \$, £ and ¥, respectively. So, numbers greater than 4 are represented with the help of these numerals only 5 = #@, 6 = ##, 7 = #\$, 8 = #£ and so on.

Which of the following will represent 18?

(A) ¥#  
(B) \$\$  
(C) ##  
(D) ££  
(E) ¥¥



In this new number system, we use  $5 = 10$ ,  $6 = 11$ ,  
 $7 = 12$ ,  $8 = 13$   
 So,  $9 = 14$ ,  $10 = 20$ ,  $11 = 21$ ,  $12 = 22$ ,  $13 = 23$ ,  $14 = 24$ ,  $15 = 30$ ,  $16 = 31$ ,  $17 = 32$  and  $18 = 33$   
 So, 18 is represented as ££

The correct answer is D.

**Directions for questions 6—9:** Based on the information given below, answer the question that follows.

During the summer vacation, Manish started 4 classes between 1 pm and 8 pm on five days (Monday to Friday) of the week—Manish learns:

- I. Swimming—all 5 days of the week at the same time slot either from 1 pm to 3 pm or from 6 pm to 8 pm.
  - II. Music—either on Tuesday, Wednesday and Friday from 2 pm to 4 pm or on Monday and Thursday from 4 pm to 7 pm.
  - III. Cricket—either on Monday and Thursday from 3 pm to 5 pm or on Tuesday, Wednesday and Friday from 4.30 pm to 6 pm.
  - IV. Yoga—on any day of the week for one 4-hour session or for two 2-hour sessions.
6. If Manish goes for the 4-hour session of yoga, on which day of the week does he attend this class?
- (A) Friday  
 (B) Monday  
 (C) Thursday  
 (D) Monday or Thursday  
 (E) Monday or Friday

Manish's daily schedule can look like this:

Monday: 4 hours of yoga from 1–5 pm or 2–6 pm and then swimming from 6–8 pm

Tuesday: Music from 2–4 pm, cricket from 4.30–6 pm, swimming from 6–8 pm

Wednesday: Music from 2–4 pm, cricket from 4.30–6 pm, swimming from 6–8 pm

Thursday: 4 hours of yoga from 1–5 pm or 2–6 pm and then swimming from 6–8 pm

Friday: Music from 2–4 pm, cricket from 4.30–6 pm, swimming from 6–8 pm

Thus, Manish can attend 4 hours of yoga on Monday or Thursday

The correct answer is D.

7. What is the maximum number of 2-hour yoga classes that are available for Manish to attend in a week, including all scenarios?
- (A) 4

- (B) 5  
 (C) 6  
 (D) at least 7  
 (E) at most 8

Scenario 1				
Day	Swimming	Music	Cricket	Yoga
Mon	1 to 3	4 to 7		
Tue	1 to 3		4.30 to 6	6 to 8
Wed	1 to 3		4.30 to 6	6 to 8
Thur	1 to 3	4 to 7		
Fri	1 to 3		4.30 to 6	6 to 8

Scenario 2				
Day	Swimming	Music	Cricket	Yoga
Mon	6 to 8	–	–	1 to 3 and 3 to 5
Tue	6 to 8	2 to 4	4.30 to 6	
Wed	6 to 8	2 to 4	4.30 to 6	
Thur	6 to 8	–	–	1 to 3 and 3 to 5
Fri	6 to 8	2 to 4	4.30 to 6	

Possible 2 hour yoga sessions in scenario 1 = Mon not possible, Tue 6–8, Wed 6–8, Thurs not possible, Fri 6–8.

In scenario 2, the 4–7 music session is not possible because it conflicts with swimming, but both cricket options are possible. If cricket is taken 3–5, the possible yoga sessions are Mon 1–3, Tue 4–6, Wed 4–6, Thurs 1–3, Fri 4–6. If cricket is taken 4.30–6, the possible yoga sessions are Mon 1–3, 2–4, 3–5, 4–6, Tue not possible, Wed not possible, Thurs 1–3, 2–4, 3–5, 4–6 and Friday not possible. So the total number of yoga sessions available across all scenarios is 16.

The correct answer is D.

8. The trainer comes to the yoga class on Tuesday; Manish attends at least one two-hour yoga session on that day. Which of the following classes can Manish attend, assuming that he has to stick to the slots and not mix slots and days?
- A. Cricket on Tuesday, Wednesday, Friday from 4:30 pm to 6 pm.  
 B. Music on Tuesday, Wednesday, Friday from 2 pm to 4 pm.  
 (A) A only  
 (B) B only  
 (C) A or B  
 (D) A and B

(E) Cannot be determined

Please refer to the two possible scenarios described in the previous question. In the first scenario, there is a possibility that Manish can attend a yoga session on Tuesday whereas in the second scenario, there is no free time slot for yoga on Tuesday from 6 to 8.

The correct answer is A.

9. If Manish attends the swimming class between 1 pm and 3 pm on all the days, when can he attend a 2-hour yoga class?

(A) Tuesday and Wednesday  
(B) Wednesday and Friday  
(C) Tuesday and Friday  
(D) None of the above  
(E) A, B or C

If Manish attends the swimming class between 1–3 pm every day, then he has to necessarily attend the Music class on Monday and Thursday from 4–7 pm. This means he has to attend cricket classes on Tuesday, Wednesday and Friday from 4.30–6 pm. Thus, he can attend the yoga classes on any two days among Tuesday, Wednesday and Friday from 6–8 pm.

The correct answer is E.

10. A major part of the rabi crop in the district was damaged due to unseasonal heavy rains during the last few days of winter. Many farmers were committing suicide.

What decision do you think the head of the agriculture department should take?

(A) The agriculture department should counsel the farmers.  
(B) The agriculture department should update the central government and wait for the Centre's directives.  
(C) It must be understood that the agriculture department could have done nothing as it was a force majeure.  
(D) The agriculture department should look at granting relief to the affected farmers by waiving loans and providing free seeds.  
(E) The agriculture department should waive loans and encourage the farmers to go to other parts of the country where rains are not heavy.

Just counselling the farmers in A will not help because their problems will still stand. Similarly, the agriculture department cannot wash its hands of

the problem by claiming force majeure in C. Waiving loans in E is a good idea but it doesn't make sense to ask the farmers to relocate to other parts of the country. Option D is the only one that makes the most logical sense and should be the correct answer.

The correct answer is D.

11. What is the value of the letter M in the given problem?

M	2	N
	x	N
2	5	5 N

(A) 1  
(B) 2  
(C) 4  
(D) 5  
(E) 6

There are only 3 values where  $N \times N$  gives N in unit place

- If N is 1, but it is not possible as then we must have got M 2 N as product
- If N is 5, then we get 5 in unit place and 2 as carry over for  $5 \times 5 = 25$ . But, then we must have got 2 instead of 5 in ten's digit at product
- $N = 6$ , then  $N \times N = 36$ , gives 3 as carry over and we have  $6 \times 2 + 3$  (carry over) = 15. So, we have 5 at ten's digit and 1 is carry over. Now, we have  $6 \times M + 1 = 25$ . It is possible for  $M = 4$

The correct answer is C.

12. The family residing in the flat adjacent to ours comprises of six people. The members are Arjun, Avinash, Sati, Savitri, Rahul and Ratul. Arjun is a doctor and the father of Rahul. Ratul is the grandfather of Avinash and an engineer. Sati is the grandmother of Rahul and a homemaker. There are two couples and the professions of the members are as follows: doctor, engineer, homemaker, consultant and two students.

Who is Ratul to Rahul?

(A) Son  
(B) Father  
(C) Brother  
(D) Grandson  
(E) Grandfather

The two students have to be the youngest members, that is, Rahul and Avinash. Sati and Ratul then become their grandparents and Savitri and Arjun

become their parents. Thus, Ratul is Rahul's grandfather.

**The correct answer is E.**

**Directions for Questions 13—16:** In an encoder a sequence of numbers is fed and the following outputs are obtained at different stages of the encoder.

Input:	14	32	99	110	88	9	11	18
Stage 1:	11	14	32	99	110	88	9	18
Stage 2:	11	99	14	32	110	88	9	18
Stage 3:	11	99	110	14	32	88	9	18
Stage 4:	11	99	110	32	14	88	9	18
Stage 5:	11	99	110	32	9	88	14	18

In this code, the numbers are basically being rearranged in every step based on a certain predefined pattern. To make this simpler to understand, let's replace each of the numbers by a letter and rewrite the steps of the code as below:

A = 14; B = 32; C = 99; D = 110; E = 88; F = 9; G = 11; H = 18

Input: A B C D E F G H

Stage 1: G A B C D E F H

Stage 2: G C A B D E F H

Stage 3: G C D A B E F H

Stage 4: G C D B A E F H

Stage 5: G C D B F E A H

We'll be using the above stages to solve all the questions asked.

13. If the output at Stage 1 is "31 19 47 86 39 13 66 69", then what is the output at Stage 5?

- (A) 31 66 47 19 86 13 39 69  
 (B) 86 31 47 39 69 13 19 66  
 (C) 31 86 39 47 66 13 19 69  
 (D) 31 13 39 47 86 66 47 69  
 (E) Cannot be determined

As per calculation done earlier:

Stage 1 = G A B C D E F H

Therefore, G = 31; A = 19; B = 47; C = 86; D = 39; E = 13; F = 66; H = 69

Now, Stage 5 = G C D B F E A H

= 31 86 39 47 66 13 19 69

**The correct answer is C.**

14. If the output at Stage 5 is "141 273 87 41 78 9 319 1012", then what is the input to the encoder?

- (A) 141 273 78 9 87 41 319 1012  
 (B) 319 41 273 87 9 78 141 1012  
 (C) 141 319 78 273 87 41 9 1012  
 (D) 41 78 273 9 141 87 319 1012  
 (E) Cannot be determined

As per calculation done earlier:

Step 5 = G C D B F E A H

Therefore, G = 141; C = 273; D = 87; B = 41; F = 78; E = 9; A = 319; H = 1012

Input = A B C D E F G H

= 319 41 273 87 9 78 141 1012

**The correct answer is B.**

15. If the output at Stage 4 is "wind flows over the river bed cool calm", then what is the output at Stage 2?

- (A) cool calm river bed over flows the wind  
 (B) cool wind flows over the calm river bed  
 (C) river bed cool calm wind flows the over  
 (D) wind flows river the over bed cool calm  
 (E) Cannot be determined

As per calculation done earlier:

Step 4 = G C D B A E F H

Thus, G = wind

C = flows

D = over

B = the

A = river

E = bed

F = cool

H = calm

Now, Step 2 = G C A B D E F H

= wind flows river the over bed cool calm

**The correct answer is D.**

16. If the output at Stage 2 is "system restart will happen in another 20 minutes", then what is the output at Stage 5?

- (A) another 20 minutes system restart will happen in  
 (B) system restart in happen 20 another will minutes  
 (C) happen 20 minutes in another will system restart  
 (D) system restart will another 20 minutes in happen  
 (E) Cannot be determined

As per calculation done earlier:

Step 2 = G C A B D E F H

Thus, G = system

C = restart

A = will

B = happen

D = in

E = another

F = 20

H = minutes

Now, Step 5 = G C D B F E A H  
= system restart in happen 20 another will minutes

The correct answer is B.

17. If 'WEDDING' is coded as 32 16 30, 'BELONGS' is coded as 19 225 40, then how is 'STRANGE' coded in the same code language?

- (A) 47 16 26  
(B) 39 19 24  
(C) 57 1 26  
(D) 57 1 24  
(E) 47 2 26

The code is such that, A, B, C...Z are represented by numbers. 1,2,3...26.

The code has 3 numbers—first number is obtained by adding number of first 3 alphabets, and third term is obtained by adding numbers of last 3 alphabets and second term is obtained by squaring the number of middle alphabet.

By using this logic we get STRANGE as (S + T + R) (Square of 1) (N + G + E) = 57 (12) 26 = 57126

The correct answer is C.

18. A company published an advertisement seeking applications from teachers for online tutoring assignments. The teachers needed to be experts in any one of the subjects: Mathematics, Physics, Chemistry or English. They also needed to be computer and internet savvy.

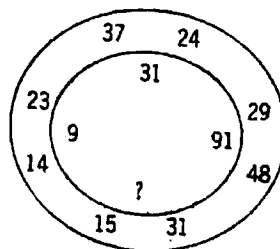
Which of the following assumptions is implicit in the given information?

- (A) The computer industry is growing at a very fast pace.  
(B) It is possible to be a teacher, as well as an online tutor.  
(C) Some teachers of Biology can also become online tutors.  
(D) The company has received the maximum number of applications for Mathematics.

- (E) Only the four subjects mentioned in the information can be taught in the online mode. B is the only assumption that is implicit in the given information. The other options are either beyond the scope of the argument or irrelevant.

The correct answer is B.

19. Which number should replace the question mark?



- (A) 16  
(B) 17  
(C) 51  
(D) 61  
(E) 62

The number in the inner circle is obtained by taking the difference between the two numbers on each side in the outer circle. Also, if this difference is greater than 10, then the order of the digits are reversed.

For example, the difference between 37 and 24 on top of the outer circle is 13, so the number on top in the inner circle is 31 (digits get reversed).

Using the same logic, the required number =  $31 - 15 = 16$

Since  $16 > 10$ , the digits gets reversed, giving 61 as the answer.

The correct answer is D.

20. Which of the options that follow will replace the question mark (?) in the series given below?

- (?) IJH NOM STR XYW  
(A) ABZ  
(B) DEB  
(C) EDC  
(D) DEC  
(E) EDF

All the three-letter words are coded in such a manner that the third letter is the first in alphabetical order followed by the first and second letters (as in IJH, RST and so on). Only option D satisfies this criterion (CDE).

The correct answer is D.

21. If 'Some More Is Good' is coded as 'ACEF', 'More Sugar Not Good' is coded as 'CEBD', 'Good More Is Bad' is coded as 'FCEI', 'Bad Is More Sure' is coded as 'IFCZ', then how is 'More Bad Is Not Good Sugar' coded as?

(A) ZFBIDC  
(B) BFDICE  
(C) ACFEIZ  
(D) BDIZEF  
(E) BIZAEF

'Some More Is Good' is coded as 'ACEF'.....i

'More Sugar Not Good' is coded as 'CEBD'.....ii

'Good More Is Bad' is coded as 'FCEI' .....iii

'Bad Is More Sure' is coded as 'IFCZ' .....iv

From i and ii, the codes for More and Good = between C and E

From i and iii, the code for Is = F

From ii and iv, the code for More = C

Thus, Good = E

Some = A

Bad = I

Sure = Z

Sugar/Not = between B/D

Therefore,

More Bad Is Not Good Sugar = CIFEBD (in any order)

**The correct answer is B.**

22. The Chairman, Hamid Ansari, tried to restore order in the House and called for the first listed question of the day but BJP members were unrelenting. He then adjourned the House till noon.

What can be inferred from the above argument?

(A) BJP members like creating nuisance.  
(B) No one cares what the chairman wants.  
(C) Questions that are asked in the House are listed.  
(D) The Chairman has the authority to adjourn the House.  
(E) Adjourning of the House becomes essential when some members are unrelenting.

D is the only option that can definitely be inferred from the given statements. The other options are either beyond the scope of the argument or irrelevant.

**The correct answer is D.**

23. **Statement:** Should the Western way of life be adopted here in India?

#### Arguments:

- (I) No. The Western culture is quite different to the Indian culture, hence should not be blindly followed.  
(II) Yes. We should be open to accepting the good from all cultures, and have a positive mindset.  
(III) No. The West has already spoilt our people a lot and it's time we turned our backs on them.  
(A) Only (I) is strong.  
(B) Only (II) is strong.  
(C) Only (III) is strong.  
(D) Both (I) and (II) are strong.  
(E) None of them are strong.

Argument I is weak because it does not give any reason in support of its thesis. Nobody is saying that the Indian and Western cultures are the same, but just because they are different is no reason to not follow the Western culture.

Argument II is strong as it gives a logical reason for accepting the Western culture.

Argument III is weak because it is negative in approach and indulges in a blame game without giving any facts to support these claims.

**The correct answer is B.**

24. Vikas took part in the discus throw event at the Olympics. After the first 3 throws, Vikas analysed the leader board. He realised that the athlete from Cyprus was ranked 5 places below him and the athlete from Tunisia was ranked 3 places above him. The athlete from Cyprus is actually 18<sup>th</sup> from the top and the Tunisian is 17<sup>th</sup> from the bottom. How many athletes took part in the competition if all the names are on the leader board?

(A) 23  
(B) 26  
(C) 35  
(D) 37  
(E) 38

As the athlete who is 5 places below him is at 18<sup>th</sup> from the top, so his position must be 13<sup>th</sup> from top and the athlete who is 3 places above him is 17<sup>th</sup> from bottom. So, he must be 14<sup>th</sup> from bottom. Hence, there are 12 above him and 13 below to him and so there must be a total  $12 + 13 + 1 = 26$ .

**The correct answer is B.**

**Directions for Questions 25–28:** From the information provided below, answer the question that follows.

Mr Gates could schedule his business meetings with five clients Mittal, Murti, Aiyyar, Ambani and Parekh only on the 31<sup>st</sup> of different months of the same calendar year, not necessarily in this order.

1. Every season except winter has one meeting.
2. Murti is slotted for the winter season but is on leave in December.
3. Mittal meets in the first month of the only two consecutive months when a meeting can take place.
4. Ambani is the last to meet Gates.
5. Aiyyar meets just before the start of the rains.

Consider the Indian seasons as:

Summer season—April to June

Rainy season—July to September

Winter season—October to January

Spring season—February and March.

Following the above instructions, the final chart will look like this:

Mittal – July

Murti – October/January

Aiyyar – May

Ambani – December

Parekh – March

25. Who is scheduled for a meeting in August?

- (A) Ambani
- (B) Aiyyar
- (C) Mittal
- (D) Murti
- (E) No one

The answer can be observed from the chart we made earlier:

Mittal – July

Murti – October/January

Aiyyar – May

Ambani – December

Parekh – March

The correct answer is E.

26. For which month is Aiyyar scheduled?

- (A) December
- (B) February
- (C) October
- (D) April
- (E) May

The answer can be observed from the chart we made earlier:

Mittal – July

Murti – October/January

Aiyyar – May

Ambani – December

Parekh – March

The correct answer is E.

27. With whom will Mr Gates celebrate New Year's Eve night?

- (A) Ambani
- (B) Parekh
- (C) Aiyyar
- (D) Mittal
- (E) Murti

The answer can be observed from the chart we made earlier:

Mittal – July

Murti – October/January

Aiyyar – May

Ambani – December

Parekh – March

The correct answer is A.

28. Who has been scheduled for the rainy season?

- (A) Parekh
- (B) Ambani
- (C) Murti
- (D) Mittal
- (E) Aiyyar

The answer can be observed from the chart we made earlier:

Mittal – July

Murti – October/January

Aiyyar – May

Ambani – December

Parekh – March

The correct answer is D.

29. The Black Spider Monkey of Brazil has become endangered because of human activities such as, deforestation and logging, which causes destruction of the monkey's natural habitat.

Which of the following if true would weaken the above argument?

- (A) Costa Rican government is constantly trying to preserve the natural habitat of the squirrel monkeys in order to save them from extinction.
- (B) A certain allele (alternate gene) discovered in a black spider monkey pointed to micro-evolutionary extinction setting in.
- (C) Habitat loss in the Congo basin has seen no remarkable change in the count of Dryas monkeys in this region.
- (D) Habitat loss in the Congo basin has seen a decrease in the count of Dryas monkeys in this region.
- (E) WWF-funded protected areas have seen a slight revival in the number of the black spider monkey.

To weaken the argument, we need to give another reason (apart from habitat loss) why the Black Spider Monkey may have become endangered. B provides this alternative reason and should be the correct answer.

**The correct answer is B.**

30. **Directions:** Given alongside are a few facts. Based on these facts, select from among the given statements, the statement that can be best concluded.

**Facts:**

**Fact 1:** Mr. Sethi has eight kids.

**Fact 2:** Two of them are studying computers.

**Fact 3:** Three of them are studying science.

**Fact 4:** Three of them are studying art.

**Fact 5:** Those who are studying science are inclined towards mechanics.

**Statements:**

- I. All of Mr. Sethi's eight kids are studying.
- II. Only three kids show an inclination towards mechanics.
- III. Mr. Sethi's kids study either science or computers or art.
- IV. Those who are studying art might also have an inclination towards mechanics.

- (A) Only (I) can be concluded.
- (B) Only (IV) can be concluded.
- (C) Both (II) and (III) can be concluded.
- (D) None can be concluded.
- (E) All can be concluded.

We can't conclude I as some children might be studying more than 1 topic and some children might not be studying anything.

We can't conclude II as, while we know that 3 children who are studying science must be inclined towards mechanics, we don't know whether the other children are inclined towards mechanics.

We can't conclude III as it is possible that in the given data 1 or more may be studying 2 or 3 topics simultaneously. So, there might be some child or some children who are also studying some other topic or topics.

We can conclude IV as those who are studying arts may also have an inclination towards mechanics.

**The correct answer is B.**

31. The more you practise, the more proficient you will become.

Which of the following strengthens the above statement?

- (A) She takes after her dad—she is as good in badminton as he is.
- (B) However much he tries to solve the questions, he just does not seem to be getting the hang of it.
- (C) No amount of practice is helping—I seem to be committing the same mistake over and over again.
- (D) She must be a genius. With a hectic schedule, she hardly gets time to practise and yet, she is one of the top contenders for the trophy.
- (E) Rajesh takes less than a minute to solve algebraic equations—he loves algebra and can be seen solving the practice questions for hours.

E gives an example of a person who has become proficient at something by regular practice. Thus, E strengthens the argument. None of the other options bring out this connection between practice and excellence.

**The correct answer is E.**

32. In the National Park, the white tigers hardly moved around, they always looked for opportunities to lie around.

From which of the following can the above statement be most properly inferred?

- (A) White tigers are usually known to be lazy.
- (B) The National Park makes the tigers active.
- (C) Only white tigers are known to hunt their food aggressively.

- (D) If an active tiger is seen at the National Park, it must not be the white tiger.
- (E) Due to their appearance, white tigers attract a lot of attention, which in turn makes them aggressive.

A is the only option from which we can infer that white tigers like to lie around—because they are known to be lazy.

The correct answer is A.

33. A multispeciality clinic was situated in the centre of a small town X, next to a leading software development company. The clinic was attending to and treating numerous patients and was earning a good profit. The software development company, which employed more than 10,000 people was abruptly shut down due to some litigation issues. After a year, the multispeciality clinic also started running into losses and ultimately closed down. The HOD stated that the reason for the losses was the closure of the software company.

Which of the following can be concluded from the passage above?

- (A) All the doctors of the multispeciality clinic left the town once the software company closed down.
- (B) After the closure of the software company, the multispeciality clinic was the only big employer in the town.
- (C) The people in the town, even if unemployed, continued to be treated at the multispeciality clinic and were also paying for the treatment.
- (D) The closure of the software company led to the loss of patients at the multispeciality clinic as most of the diseases originated in the software company.
- (E) The chief reason for the closure of the multispeciality clinic was the unemployment of the majority of the population in the town as they were not able to afford expensive treatments.

Logically, the only connection between the clinic closing down and the software company closing down has to be the fact that the employees of the software company were the regular clientele of the clinic. When the software company shut down, this clientele was lost and so the clinic also had to shut down eventually. E conveys this reasoning and should be the correct answer.

The correct answer is E.

34. Directions: Given alongside is a statement followed by a few suggested courses of action. For the

given situation, select the best course of action that follows.

**Statement:** There is quiet unrest among people today - it will be no surprise if this simmering discontent turns into some kind of violent protest.

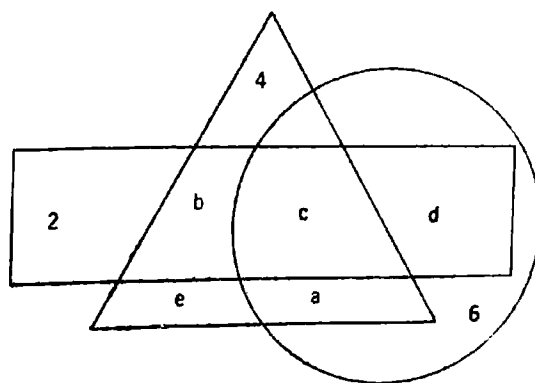
**Courses of Action:**

- I. The government needs to be sharp and realise the mood of its people—it should take steps to address the existing pain points and not allow anything to snowball.
  - II. The government should carry on with its work as usual—unrest in people is obvious when things become difficult.
  - III. The government needs to focus on the economy—everything else will fall into place.
- (A) Only I should be pursued.
- (B) Only II should be pursued.
- (C) Only III should be pursued.
- (D) Both II and III should be pursued.
- (E) None should be pursued.

Option I is the only one that makes sense because if the issue of public discontent is ignored, it could turn into a major crisis situation for the government.

The correct answer is A.

35. Directions: Use the following diagram to answer the given question. The overlapped area suggests the product of the numbers of each figure in the diagram.



The value of which of the following is the minimum?

- (A) a
- (B) b
- (C) c
- (D) d
- (E) e



$$a = 6 \times 4 = 24$$

$$b = 4 \times 2 = 8$$

$$c = 6 \times 4 \times 2 = 48$$

$$d = 6 \times 2 = 12$$

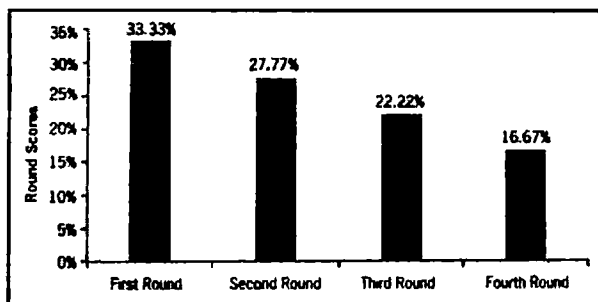
$$e = 4$$

Thus, e is the minimum and is the correct answer.

**The correct answer is E.**

**Directions for Questions 36–39:** Answer the questions using the information given below.

In 'Famous Casino' situated in Monte Carlo, three friends A, B and C are playing with a fair die, which has the numbers 1, 2, 3, 4, 5 and 6 marked on its six faces. Turn by turn, each one of them rolls the die once and notes down the outcome obtained. At the end of the first three rolls, a 'round' gets completed. The players roll the die to complete three more such rounds. For each round, the "round score" is defined as the sum of the three outcomes obtained in that round. The following chart represents the 'round scores' of the rounds expressed as a percentage of the maximum possible round score.



36. Which of the following outcomes could never have been obtained by A in any of the four rounds?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) 5

$$\text{Total score in round 1} = 33.33/100 \times 18 = 6$$

$$\text{Total score in round 2} = 27.77/100 \times 18 = 5$$

$$\text{Total score in round 3} = 22.22/100 \times 18 = 4$$

$$\text{Total score in round 4} = 16.67/100 \times 18 = 3$$

Given the above calculation, there is no way A (or any other person) could have scored a 5 on any throw because we won't be able to reach a total of 6 (the maximum score for the four rounds) among three people then. If one person gets 5, then the lowest the other two people could get is 1 and 1, which would still add up to 7.

**The correct answer is E.**

37. In the third round, what percentage of the round score was contributed by the outcome of B?

- (A) 25%
- (B) 33%
- (C) 50%
- (D) 60%
- (E) Cannot be determined

We do not know the score of B in the third round, so we cannot calculate the percentage of the round score contributed by him.

**The correct answer is E.**

38. It is given that a particular pair of players obtained the same outcome in each of the four rounds. What was the outcome obtained by the other remaining player in the second round?

- (A) 1
- (B) 2
- (C) 3
- (D) 4
- (E) Cannot be determined

$$\text{Total score in round 1} = 33.33/100 \times 18 = 6$$

$$\text{Total score in round 2} = 27.77/100 \times 18 = 5$$

$$\text{Total score in round 3} = 22.22/100 \times 18 = 4$$

$$\text{Total score in round 4} = 16.67/100 \times 18 = 3$$

Round 4 has the lowest Round score. Each player in this Round must have scored 1. As per the questions, two players got this score (a score of 1) in the remaining three rounds as well. Thus, these two players contributed 2 points to a total score of 5 obtained in Round 2. Therefore, the third player must have got a score of  $5 - 2 = 3$ .

**The correct answer is C.**

39. In the first round, C was the first player to roll the die. In the subsequent rounds, the die was rolled for the first time by the player who obtained the largest number as the outcome in the previous round. In the subsequent rounds, if C never got the honour of rolling the die for the first time, which of the following could be the sum of the four outcomes obtained by C?

- (A) 5
- (B) 6
- (C) 7
- (D) 8
- (E) None of these

Total score in round 1 =  $33.33/100 \times 18 = 6$

Total score in round 2 =  $27.77/100 \times 18 = 5$

Total score in round 3 =  $22.22/100 \times 18 = 4$

Total score in round 4 =  $16.67/100 \times 18 = 3$

In the first round, the highest score by a person could be a 3 or 4, so C must have scored a 1 or 2.

In the second round, the highest score by a person could be a 2 or 3. So C must have scored a 1.

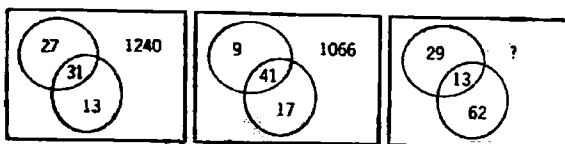
In the third round, the highest score by a person has to be 2, so C must have scored a 1.

In the fourth round, each player scored a 1.

Thus C's total possible score can be a 4 or a 5, making A the correct answer.

The correct answer is A.

40. Which number can substitute the question mark?



- (A) 3250  
(B) 3057  
(C) 2224  
(D) 1728  
(E) 1183

$$1240 = 31 \times (27 + 13)$$

$$1066 = 41 \times (9 + 17)$$

Using the same rule,

$$\text{the required number} = 13 \times (29 + 62)$$

$$= 13 \times 91$$

$$= 1183$$

The correct answer is E.

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